

COMPUTERWORLD

FOCUS

PLOTTING YOUR PC STRATEGY

IS MAIL ORDER
WORTH IT?

IBM'S PC
STRATEGY

SYSTEM
UPGRADE TACTICS

THE MAC ATTACK

**SPECIAL
SECTION:
DESKTOP
PUBLISHING**

*****5-DIGIT 48106
C00069704-4 C
UNIVERSITY MICROFILMS
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

Draw Now you can *DB2 OR*
~~paint~~ your entire IMS
application system.

APS

APPLICATION PRODUCTIVITY SYSTEMS FOR DB2, IMS AND CICS DEVELOPMENT CENTERS

Once again, SAGE SOFTWARE, INC. beats the others to the draw.

APS/PC DRAWING SYSTEM, the newest addition to the APS family of productivity tools, adds new productivity to front-end design. Now you can draw your DB2, IMS and CICS COBOL-based application system...and they'll always be right.

APS/PC DRAWING SYSTEM is the intelligent drawing system. It's rule-based and icon-driven, so you can't make a mistake. You can use our rules and icons or define your own.

Most importantly, APS/PC DRAWING SYSTEM is the integrated system for designing and building application systems at the PC workstation. Front-end drawings are easily extended into working prototypes.

And that's not all. Where the others stop, we keep going.

APS/PC LINK automates communication to the MVS-based APS APPLICATION GENERATORS so you can generate complete systems. Together, they provide the most power-

ful integrated PC workstation and mainframe generators available today.

APS/PC DRAWING SYSTEM is the picture of productivity. But don't take our word for it...draw your own conclusions.

To learn more about APS/PC DRAWING SYSTEM and other members of the integrated family of APS products, call us toll-free at 800-638-8703 or just send in the coupon below.

Tell me more about the APS Development Center.

- ☐ Timing is important. Please tell me about *FAST TRACK*.
- ☐ Have an APS representative call me to schedule a presentation.
- ☐ Send a schedule of upcoming APS Seminars.
- ☐ Send me information about the APS family of products.

Name

Title

Organization

Address

City State Zip

Phone Date

Mail to Marketing Services, SAGE SOFTWARE, INC.
3200 Monroe St., Rockville, MD 20852



SAGE SOFTWARE, INC.

3200 Monroe Street • Rockville, MD 20852 • 301/230-3200 • 800-638-8703

APS supports batch and online requirements for DB2, IMS DB/DC, CICS, DL/I, VSAM, IDMS, and DATACOM DB production environments.
CIRCLE READER SERVICE NUMBER 254

CONTENTS

COMPUTERWORLD
FOCUS

CW COMMUNICATIONS/INC.
Box 9171, 375 Cochituate Road,
Framingham, Mass. 01701-9171

Editorial Director/Editor

Ann Dooley

Managing Editor

Lory Zottola

Features Editor

Michael Tucker

Senior Editor

Stan Kolodziej

Senior Writer

Rebecca Hurst

Assistant Editor

Julie Cook

Editorial Assistant

Catherine Gagnon

Display Advertising Manager

Carolyn Novack

Production Director

Peter Holm

Senior Production Manager

Leigh Swearingen

Art Director

Tom Monahan

Photographer

Geoffrey J. O'Connell

Typesetting Manager

Carol Polack

Production Assistants

Christopher P. Cuoco, Beverly Wolff

Computerworld Editor in Chief

Bill Laberis

Board Chairman

Patrick J. McGovern

Chief Executive Officer

CWCI, Inc.

Axel Leblais

President/CWCI, Inc.

Tom Casalegno

Publisher/President

CWCI-Framingham

Lee Vidmer

Senior VP-Communication Services

Jack Edmonston

Vice-President/Sales

Edward P. Marecki

Second-class postage paid at Framingham, Mass., and additional mailing offices. Computerworld (ISSN-0010-4841) is published weekly, except January (5 issues), February (5 issues), March (6 issues), April (5 issues), May (5 issues), June (6 issues), July (5 issues), August (6 issues), September (5 issues), October (5 issues), November (6 issues), December (4 issues) and a single combined issue the last week in December and the first week in January by CW Communications, Inc., Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Copyright 1987 by CW Communications, Inc. All rights reserved. Reproduction of material appearing in Computerworld and Computerworld Focus is forbidden without written permission. Send all requests to Nancy Shannon.

Computerworld subscription prices: \$2.00 a copy; U.S. — \$44 a year; Canada, Central & So. America — \$110 a year; Europe — \$165 a year; all other countries — \$245 a year (air-mail service). Computerworld Focus price: \$5.00 a copy. Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

Computerworld can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Computerworld is indexed: write to Circulation Dept. for subscription information.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$5.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, MA 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol: §

POSTMASTER: Send Change of Address to Computerworld Focus Circulation Dept., P.O. Box 1016, Southeastern, PA 19385-9964.

Computerworld is a member of the CW Communications, Inc. group, the world's largest publisher of computer-related information. The group publishes over 80 computer publications in more than 28 major countries. Fourteen million people read one or more of the group's publications each month. Members of the CWCI group contribute to the CW International News Service offering the latest on domestic and international computer news. Members of the group include: ARGENTINA'S Computerworld/Argentina, PC Mundo; ASIA'S Asian Computerworld; AUSTRALIA'S Computerworld Australia, Communications World, Australian PC World, Australian Macworld; AUSTRIA'S Computerwelt Oesterreich; BRAZIL'S DataNews, PC Mundo, Micro Mundo; CHILE'S Informatica, Computacion Personal; DENMARK'S Computerworld Danmark, PC World Denmark; FINLAND'S Tietotietto, Mikro; FRANCE'S Le Monde Informatique, Distributique, InfoPC, L'Informatique; GREECE'S Micro and Computer Age; HUNGARY'S Computerworld/SZT, Mikrolog, Tudomany; INDIA'S Dataquest; ISRAEL'S People & Computers Weekly, People & Computers Monthly; ITALY'S L'Espresso Informatica; JAPAN'S Computerworld Japan; MEXICO'S Computerworld Mexico; THE NETHERLANDS' Computerworld Netherlands, PC World Netherlands; NEW ZEALAND'S Computerworld New Zealand; NORWAY'S Computerworld Norge, PC World Norge; PEOPLE'S REPUBLIC OF CHINA'S China Computerworld, China Computerworld Monthly; SAUDI ARABIA'S Arabian Computer News; SOUTH KOREA'S Electronic Times; COMPUTERWORLD, PC World; SPAIN'S Computerworld Espana, Commodore World, PC World Espana, Comunicaciones, Informatica Industrial; SWEDEN'S ComputerSweden, Mikrolog; SWITZERLAND'S Computerworld Schweiz; UNITED KINGDOM'S Computer News, DES Today, K2 Today, PC Business World, Lotus UK; UNITED STATES' Amiga World, Boston Computer News, CD-Rom, Computerworld, Computers in Science, Digital News, Federal Computer Head, 80 Micro, FOCUS Publications, InCider, InfoWorld, MacWorld, Micro Marketworld, Network World, PC World, Portable Computer Review, Publish, PC Resource, RUN; VENEZUELA'S Computerworld Venezuela; WEST GERMANY'S Computerwoche, PC Welt, Run, Information Management, PC Woche.



Page 36



Page 23



Page 7



ABOUT THIS ISSUE

The PC arena is going through another evolution, as you'll find out in this month's issue. In the corporate market, stalwarts like IBM are jockeying for position, while upstarts like Apple with its desktop publishing punch are surging ahead. The 386 continues to get more attention than it does software. And new purchasing channels like mail order give buyers more choices than ever before. Amidst the hubbub stands MIS whose job it is to sort through the possibilities and make a smooth transition into the next generation.

FEATURES

Is IBM In The PC Business?

15

Brian Jeffery, Jan Lewis and Amy Wohl

Everyone wants to know what the new IBM Personal Computer line will offer. Three noted industry analysts share their predictions about IBM's PC strategy for '87 and beyond.

So, You Want To Be A Beta Site?

19

Stan Kolodziej

Beta testing can provide a competitive edge or be a disaster. Read about companies that have chosen to be beta sites and whether they'd do it again.

The Mac Attack

21

Stan Kolodziej

To the surprise of many, the Apple Macintosh is gaining respect in the business sector. See what has spurred the Mac's growing corporate popularity.

Mail-Order Micros Win Stamp Of Approval

29

Rebecca Hurst

Mail-order firms are starting to make inroads with Fortune 2,000 purchasers. Is this a viable option for MIS, or should it still be a last resort?

Routes To Systems Upgrades

31

Aaron Goldberg

Upgrading your micros for next-generation environments can be a monumental task. This PC analyst explains what such a move entails and if this path is right for your company.

The Strategist And The PC

36

Michael Tucker

Personal computers can make your company more effective, but can they be strategic weapons? Read how users and analysts view the PC and, more important, the information it provides.

SPECIAL SECTION:

Desktop Publishing

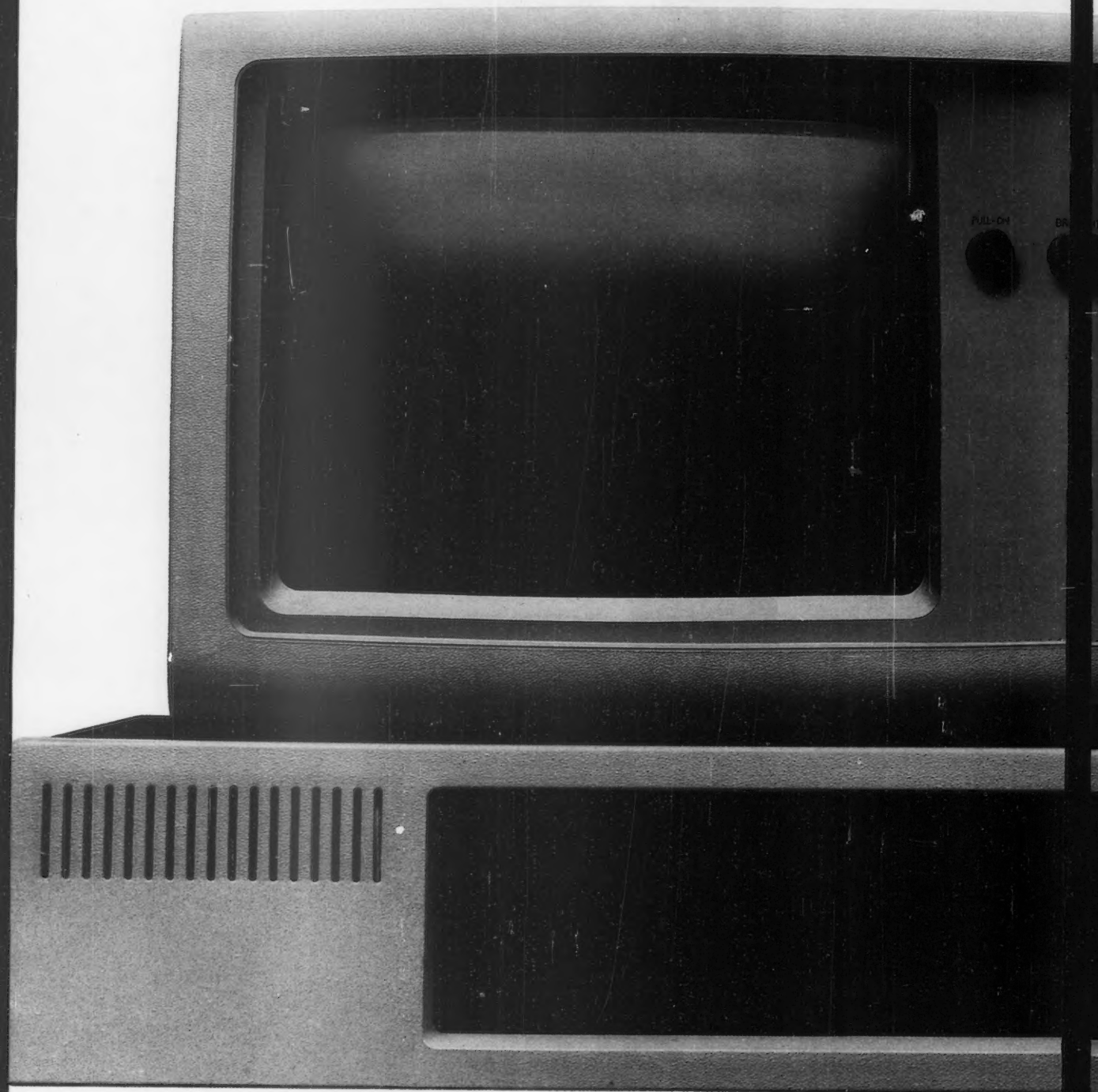
23

User interest in electronic publishing received its push at the desktop level with the success of the Apple Mac and Laserwriter printer and Aldus Page-maker software. No matter if an organization's needs are large or small, users' glowing praises for computer-aided publishing abound. Our Special Section story this month, written by *Focus* senior writer Rebecca Hurst, gives you a look at the desktop publishing phenomenon and its future.

DEPARTMENTS

Editorial	5
Letters	5
Manager's Corner	6
Q&A	7
Blue Beat	8
Insider	9
News Analysis	11
Products	41
Calendar	44

Underachiever.



Using a PC merely as a stand-alone is rather like using a race car to fetch the groceries. A severe case of under-utilization.

But it's a widespread problem. And, since PCs are here to stay, a serious one. So we at Hewlett-Packard did some hard thinking—which resulted in the Personal Productivity Center (PPC). The PPC is an office information system based on the HP 3000 family of computers. It's designed to help you realize the full potential of your PCs, including IBM.

One way the PPC does this is with HP Information Access. It gives your PC users a consistent, relational-like interface to data anywhere in the network. Without special programming. It can save data in a variety of formats, such as 1-2-3® from Lotus® and R:Base™ 5000, right on the PC. This means that its data can be manipulated and analyzed off-line. So your users are less prone to ask you for special reports. Leaving you free to satisfy your users' more important needs.

With HP Advancemail, your PC users can send messages and files to any user on the network, as well as process mail off-line. Which means not only added convenience for your PC users, but less drain on the host system.

All of these capabilities are given to your IBM PC users as well. And every PC user can also send any DCA-compatible file throughout the network, the file automatically being converted to the format which the recipient can read and edit. Your PCs are linked to each other as well as to central data bases—yet they also provide users with their own local processing power and familiar user interface.

The Personal Productivity Center, as you can see, is quite a remarkable achievement. Made more so because it can be integrated with IBM PROFS and DISOSS mainframe office systems. It lets your PC users share printers, discs and tape back-up devices. And it comes from the company with an unsurpassed record of service and support; the company that never stops asking "What if..." about how best to help you fully utilize your PCs.

For more information, call 1 800 367-4772, Dept. 132B.

1-2-3® from Lotus® is a U.S. registered trademark of Lotus Development Corporation.
R:Base™ 5000 is a U.S. trademark of Microrim® Inc.



**HEWLETT
PACKARD**

Business Computing Systems

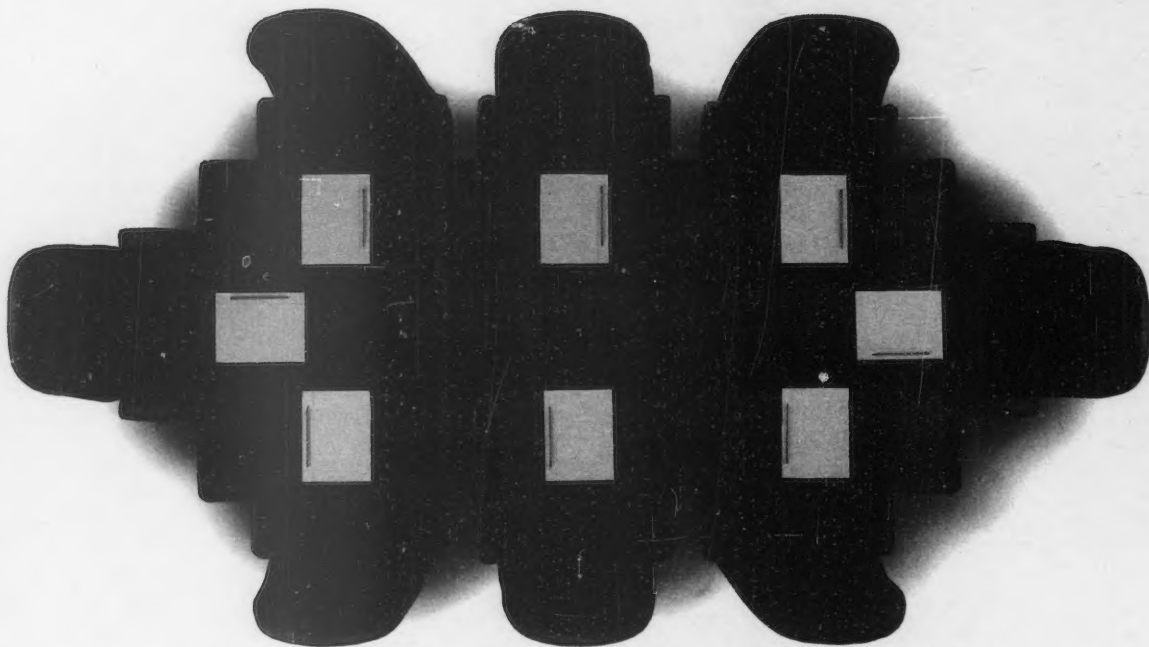
© 1987 Hewlett-Packard Co.

IS02703

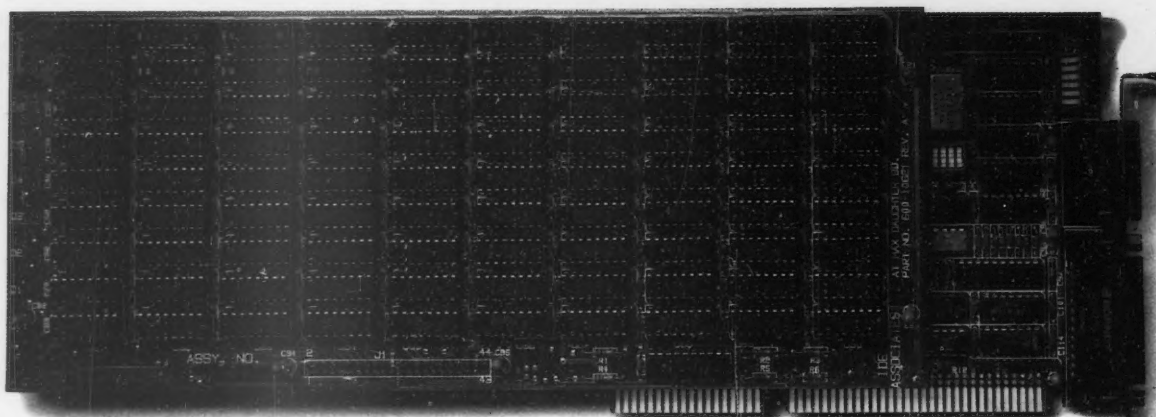
CIRCLE READER SERVICE NUMBER 257

*we never
stop
asking*

"What if..."



One board runs IBM.



One board runs the IBM AT.

Presenting the chief operating board of the IBM AT. IDEA Supermax/EMS. The only multifunction card for the AT with 4MB of RAM to support expanded, extended and conventional memory. Along with three standard I/O ports, two serial and one parallel.

Its expanded memory is compatible with software written to the Lotus/Intel/Microsoft* specification. So you're able to juggle large spreadsheets and databases at lightning speed. In addition, IDEA Supermax software gives you print spooling from expanded memory.

And, if you choose, you can use the 4MB of RAM as extended memory to create a virtual disk, or work in a XENIX* environment. IDEA Supermax works with both 6 and 8 MHz/ATs.

It took one board to create the IBM AT, but it takes another board to master it. IDEA Supermax/EMS.

Call 800-257-5027 for more information.

IDEAssociates™

IDEAssociates, Inc., 29 Dunham Road, Billerica, MA 01821, (617) 663-6878, Telex 4979780 *IBM, Lotus, Intel, Microsoft and XENIX are registered trademarks of International Business Machines Corporation, Lotus Development Corporation, Intel Corporation, and Microsoft Corporation, respectively. IDEA Supermax/EMS is a trademark of IDEAssociates, Inc.
CIRCLE READER SERVICE NUMBER 258

PC VIEWPOINT

EDITORIAL

MIS Decision Time

MIS managers will be forced to make some hard decisions shortly, and no matter what actions they take, it's unlikely they will emerge unscathed.

A host of personal computer operating systems are due to arrive, each offering specific and very distinct features. These systems include, in addition to the current Microsoft MS-DOS environment, the Apple Macintosh and the IBM soon-to-be-announced, low-end graphics systems. Microsoft's 286 DOS, IBM's Advanced DOS and, eventually, its Intel 80386-based operating system environment are also the subjects of intense speculation.

IBM's operating system for the 386 is expected to be different from Microsoft's 80286 DOS version and also be incompatible with existing applications that do not run in the IBM Advanced DOS mode. This move by IBM is an attempt to close down the clone makers, but it also creates the problem of whether to rewrite incompatible software and how to reformulate it most effectively. Trying to jerry-rig the existing systems probably would either be unsuccessful or would not allow access to some portion of the new capabilities.

On one hand, the new operating systems will offer users increased connectivity and, most important, increased multitasking capabilities that until now were available only on minis and mainframes. On the other hand, migrating to the systems will swallow large amounts of training and support resources and could jeopardize feelings of good will.

PC planners must also commit to the 286 or the 386 system. The shelf life of the 286 must be balanced against the unknown 386 version that is not expected to be introduced for yet another year. MIS must assess whether it is worth the time, expense and confusion to rewrite and upgrade their existing systems to the 286 environment or wait approximately two years or more for the 386 version. This will be one of the most difficult problems to solve in terms of system migration. Few organizations are equipped or willing to make that kind of continuing effort in upgrades for so short a time — especially if the reason for the upgrades is based on a particular vendor's market strategy rather than true user demand.

This is a long-range decision that MIS needs to handle carefully. MIS must continue to establish good working relationships with PC users and managers. If these groups are not offered a smooth, well-planned strategy and transition, MIS/end-user relations could be set back several years. And if large sums of money are sunk into converting systems that only do half the job, MIS/upper management relations are going to be set back, too. MIS managers will be making such long-range decisions amidst a number of unknown variables that may all hold a potential downside.

Ann Dooley

LETTERS

Don't Leave Your Future To Others

I am responding to Kevin Kilpatrick's letter "Graduate Urges Gearing Studies To 'Real World'" in the Jan. 7, 1987 issue of *Computerworld Focus*.

While I do not disagree with Mr. Kilpatrick's assertion that educational institutions do not have enough in the way of co-op programs for providing paid experience, I also believe that institutions are responsive to market forces. Most graduates that I deal with will not consider giving up their summers to pursue co-op programs.

I see an opportunity here for some committed people to get a few business students together to contact companies and set up programs themselves. Market the programs to students, interview candidates, place them in the company and charge a fee. Everybody gains from the experience, and you might even turn a profit.

The bottom line is this: Don't leave your future to others. It is not preordained. Look to your future and invest the sweat today to make it happen. Besides, maybe you'll make my life a little easier when you come to me with some experience that I can leverage into a career position and not "just a job."

Ken Yeager
Executive Recruiter
Data Processing Division
Futures Personnel Services, Inc.

Programmer Knows
Cobol Is Healthy

I recently read the "Cobol Shapes Up" article in the Jan. 7, 1987 issue of *Computerworld Focus*. I enjoyed it very much. Of course, as a Cobol programmer for more than 20 years and president of a Cobol tool software house, I already knew that Cobol never died. I now do all my programming on an IBM Personal Computer XT using Realia, Inc. Cobol exclusively.

However, your article omitted Group Operations, Inc.'s Superstructure as one of the automated Cobol restructurers.

David Kleinberg
President
National Database Software, Inc.
West Bloomfield, Mich.

Let's Not Forget
Ryan-McFarland

I read with interest the article entitled "Cobol Shapes Up" in the Jan. 7, 1987 issue of *Computerworld Focus* and was

somewhat surprised that there was no mention of Ryan-McFarland Corp., supplier of what many consider to be the industry-standard microcomputer Cobol.

Your readers may be interested in the following information about Ryan-McFarland:

- In 1975, Ryan-McFarland developed the first minicomputer 1974 Cobol for NCR Corp.
- In 1977, Ryan-McFarland developed the first microcomputer Cobol for Zilog, Inc.
- Some 500,000 RM Cobols have been installed worldwide since 1978.
- Because it is highly portable, RM Cobol has been verified for more than 250 different CPU operating system environments. Some 3,000 applications have been developed for RM Cobol.
- One of Ryan-McFarland's development team members has long been on the ANSI X3J4 committee that defines and publishes the Cobol standard.

Donald R. Ryan
President
Ryan-McFarland Corp.
Rollings Hills Estates, Calif.

Shown The Errors
Of Our Ways

Twice recently you have published statements in *Computerworld Focus* that are directly contrary to widely known facts. In both cases, the statements issue from persons who are presumably experts and probably accepted as such by most of your readers.

You owe it to your readers to set the record straight.

In the article "The Force Behind End-User Computing" [*CW Focus*, Nov. 12, 1986], Aaron Goldberg offers the astounding assertion that "the 386 is the first microprocessor that has full 32-bit data and memory paths." This no doubt comes as a big surprise to Motorola, Inc., National Semiconductor Corp. and AT&T, all of which have had such chips in service for at least two years.

In the article "Blending MS-DOS and Unix" [*CW Focus*, Jan. 7, 1987], Philip Gill contends that Unix "does not run . . . programs such as . . . 1-2-3, Microsoft Word, Multiplan and more." Someone should inform Mr. Gill that dozens of Microsoft Corp. MS-DOS programs have long ago been ported to Unix, including Multiplan and Microsoft Word (which I am using on a Unix machine to write this letter!) The list also includes Ashton-Tate Dbase III, Micropro International Corp. Wordstar 2000 and Computer Associates International, Inc. Supercalc.

W. Brewster Gillett
Portland, Ore.

Attention Readers

Computerworld Focus will be published 12 times in 1987. We welcome letters to the editor and publish those we judge to be of interest to our readers. Letters may be edited for clarity and brevity.

Letters should be addressed to the Editor, *Computerworld Focus*, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

CW subscribers will continue to receive *Focus* with their subscriptions.

dB

BY RICH TENNANT



PC VIEWPOINT

Vendor Support: You Don't Know What You've Got 'Til It's Gone



MANAGER'S CORNER

Jim Young

A good working relationship between MIS and a vendor should be based on trust, understanding and cooperation. Unfortunately, in times of stress and change, relationships can sour and deteriorate. For a business, such circumstances can be tragic because it takes time, money and effort to rebuild a partnership or search for a new one.

Many MIS managers take their vendors for granted. Managers know their

hardware vendors supply equipment maintenance and repair services; if problems should arise, managers expect that the vendor will handle the problems quickly, inexpensively and correctly.

The same may be said of major software suppliers. As long as a package works from day to day, MIS takes the vendor for granted and assumes that problem correction, planned modifications and future support will take care of themselves. The same scenario takes place with other vendors such as contract technical assistance, supplies providers, training and research providers, personnel assistance and others.

Vendor support is important. Indeed,

the reason this area frequently reaches crisis proportions is that it is key to keeping equipment running, meeting project deadlines, maintaining budgeted spending, training staff and users and all the other functions that allow the DP department to provide services to a company.

Get out the service contract

If a DP manager feels that a vendor is inattentive to his firm's needs, he may resort to invoking the terms of the service contract. This action will often fail to get satisfying results, however. When defining each party's expectations and responsibilities at the service level, contracts many times only deal in generalities.

Moreover, these documents define minimal expectations, if anything. If you must resort to using legal enforcement against a vendor, your relationship is already in serious trouble.

A manager can take preventative steps to optimize the working relationship with a vendor. Here are some ways to keep up a successful vendor relations program:

■ Define your vendors.

Make sure you know all those that currently serve you or that may be essential for your company in the future. Separate those vendors of secondary impact from those that require exceptional attention.

■ Define your vendors' roles.

First of all, start with a contract. The next step should be to proceed with a face-to-face meeting to determine a mutual understanding of the role each party will play. Get answers to questions about charges, problem evaluation, authorization, billing procedures, training, service and the like.

The other areas you will want to clarify will depend upon the type of vendor, the type and level of service you expect and the experience of other DP shops with this vendor.

■ Clarify the lines of communication.

You may want to identify the primary contacts that will collect problems and requests for the other party and screen and respond to requests going back to it. Remember, communication is a two-way street. Vendors trying to serve you will have many requests and requirements to which you will have to respond. For both parties, keeping the requests reasonable and within the rules will be the first mission. Beyond that, someone should track the requests and should keep the appropriate players informed.

■ Meet periodically.

Discussions are a healthy way to identify early problems and ensure that service levels are at the top of everyone's agendas. Discussions most typically will focus on the status of specific tasks or requests, but you can also cover items such as general education on organization status, review of past accomplishments and projects and exchange of other information. Each firm's business plan is vital information to share. In this way, you might learn of a vendor's product or service that you may need, while the vendor can identify an evolving need in your company that it may be able to fulfill.

■ Develop ways to resolve conflict.

Problems that you cannot resolve through lower level discussions should either be given to management or arbitrated based on rules you have set up. It is important to keep disagreements in perspective and not allow them to destroy an otherwise effective working relationship. Having top management involved in important problems not only minimizes lower level impact but also keeps management aware of vendor service levels.

With everyone aware of the importance of vendor service levels and with defined roles for key people to play to maintain these levels, you can improve your vendor partnership and avoid catastrophes that hit less prepared DP shops.

We knew 25 years ago there would be changes.



Like most, we started out small.

But we planned for changes. And grew fast.

Today, Leasametric is your single-source supplier for every data communications need. And the most stable company in the business.

You'll find brand name PCs, terminals, printers, modems, multiplexers, local area networking capabilities, everything.

Soon, even high-end micro computers. Systems integration. And value-added offerings.

Which gives us the industry's most comprehensive inventory.

And, at Leasametric, you can rent or lease, with finance plans that fit your tax plans. Like long- and short-term rentals. And fair-market-value and finance leases. Or you can buy equipment, both new and used.

You get a complete range of services, too.

Including on-site maintenance, return-to-depot programs, time and materials, and more.

So for data communications, think Leasametric. Your single-source supplier.

And the only 25 year old in the business.



LEASAMETRIC
Data Communications Division

All the equipment. All the service. All the time.

Northern California & Pacific Northwest 415-574-5797 • Southern California 1-800-638-8574 • Rocky Mountains 1-800-638-7854 • Southeast 1-800-241-5841 • Central 1-800-323-4823 • Northeast 1-800-221-0246

CIRCLE READER SERVICE NUMBER 259

Young is principal and director of consulting for Arthur Young & Co. in Worcester, Mass. He has worked in the industry for 15 years.

PC VIEWPOINT

MMA Member Gross Champions Buyer's Rights

As an executive board member of the Microcomputer Managers Association, Inc. (MMA), Alan Gross protested ADAPSO's controversial hardware lock-and-key proposal until the software vendor group dropped it last July.

Gross has represented the MMA on the Microsoftware Customer/Vendor Advisory Board (MCVAB) since it was founded in April 1986. The group, made up of ADAPSO members and representatives from government, corporate, educational and individual user organizations, meets quarterly to resolve conflicts between vendors and users.

Gross recently spoke with Computerworld Focus senior writer Rebecca Hurst about the MMA's involvement with the board and the MMA's proposals for solutions to the problems of purchasing and maintaining microcomputer software in a corporate environment.

What has MCVAB accomplished since it was founded?

The first problem we addressed was the issue of warranties. The "as is" warranties offered by many companies were not enough. We resolved that warranties should at least offer users their money back if they're not satisfied. That is more of an end-user issue. Corporations spend almost 10 times the cost of the product in evaluating it, and we almost always get evaluation copies anyway.

The warranty issue has helped us to set the ground rules for discussing other issues. We've begun working on a buyer's guide for end users, and, at the last meeting, we began to discuss corporate issues.

What corporate issues do you hope to resolve through MCVAB?

The MMA is working for negotiated license agreements to develop a closer relationship between the vendor and customer. We also want to improve a corporation's ability to manage and utilize software. We need different ways to handle agreements within relative guidelines because every company manages and purchases software differently. Additionally, vendors have limitations based on such factors as size and profitability.

There are six subissues related to license agreements: copy protection; training; truth in advertising; the ability to get copies of documentation; bug fixes; and upgrades and distribution. However, the real issue is how to develop these license agreements.

Negotiation is an expensive process; it can cost a company \$100,000 to \$200,000 [in overall expenses]. Instead of negotiation, we feel, there should be general contract solutions. It could be a menu approach in which the contract lists options and a price tag associated with each option. Users could choose which of the options they want. [Computer Associates International, Inc.] has been doing this with Supercalc for years.

Can't you pattern microcomputer software licenses after mainframe software contracts?

Yes, in part, but maintaining microcomputers is different from managing mainframes. A mainframe is usually a

single site. That's much easier to handle than 800 micro installations that may be remotely located or politically separated.

What are the most important licensing

Q&A



Alan Gross

issues for micro managers now?

Upgrading and distribution are the biggest concerns for us. One aspect of this is the frequency of releases. After a few little tweaks and features, vendors rush new versions out. Some firms release versions every three months to stay competitive. It's craziness.

A typical corporate environment may have 1,000 personal computers scattered around in 20 to 30 locations. A vendor comes out with a new release of the software, and someone in the company has to test the software. This can take anywhere from one to three months.

Once the company has decided to install the version, the user has to install the product, move data from the old software to the new and remove the old version. A single machine can take from half an hour to three hours or more [to complete this process]. Then multiply that by another 1,000 or so machines.

Also, a lot of users are building automated systems around software products. For example in Lotus Development Corp. 1-2-3, Version 1A, the package has an exit prompt that asks whether you want to leave. Later versions of the application don't ask users [if they wish to exit the program]. If you have built an automated system that waits for the exit prompt, your system no longer works. Rewriting systems for new application versions is a major hidden cost.

What other problems do you encounter with upgrades and distribution?

Two problems are the inability to buy the old versions of products and the vendors' requirements for old disks.

Right now, we're forced to buy the new version of an application as soon as it appears because vendors take the old one off the market. If we buy a computer, we have to get the new software versions for it. Because we try to avoid mixing versions, we have to install the new version on our existing micros as well.

Additionally, some vendors require

you to collect used system disks when you upgrade to the new version. There's no way any micro manager can locate them all, though. There may be 50, 100 or 1,000 disks floating

you propose?

Under a license agreement, we could build in an annual fee, and the vendors could build in upgrade consistency. For instance, vendors could design an application so users could upgrade from the first version to the fifth without going through the three versions in the middle. This would allow the vendors to continue their upgrades, but it would allow us to upgrade in a more timely matter.

Corporate users should also be allowed to purchase the older version of an application under the terms of a license. Then users could postpone their move to the newer release until they're ready.

Do managers have any concerns about the products themselves?

One problem we have is getting information from vendors about confirmed software bugs. We can't just call up and get a list of bugs. I'm a programmer; I know all software has bugs. Maybe 90% of them are meaningless, but another 10% are real confirmed problems. Vendors don't have to publicize these bugs, but if I'm building a multimillion-dollar system based on a bug, I need to know.

Vendors should be responsible and ethical enough to provide that kind of information when users are putting their businesses on the line using a product.

around companies. It's a ridiculous waste of effort.

What solutions to these problems do

DO YOU MANAGE BY TRIAL AND ERROR?

PEOPLE MANAGER ONE™ is a personal computer-based management system which eliminates management by trial and error. It is a cohesive and proven set of management tools and practices which helps a manager or supervisor:

- Set Key Performance Assignments
- Assess Assignment Performance
- Prepare Performance Appraisals
- Identify Skills Needed to be Successful on the Job
- Prepare Training & Development Plans

PMI contains over fifty pages of help screens like:

- How to Select an Objective
- Measuring Assignment Difficulty
- Hints for Conducting Effective Performance Appraisals

And ten printed reports, such as:

- Individual Performance Objectives
- Skills Profiles
- Individual Development Plans
- Performance Appraisals

People Sciences, Inc. can also customize a version of PEOPLE MANAGER ONE™ for your organization. We can incorporate your performance appraisal and provide functional skills sets by position to help set organizational standards of proficiency and performance. Site Licenses, Pilot Programs and Volume Discounts available. PEOPLE MANAGER ONE™ runs on IBM and compatible personal computers.



PEOPLE SCIENCES, INC.
76 Durand Road
Maplewood, N.J. 07040
(201) 762-8259

IBM is a registered trademark of the International Business Machines Corporation. PEOPLE MANAGER ONE is a trademark of People Sciences, Inc. Copyright 1986.

☐ Please send _____ copies of PEOPLE MANAGER ONE™ at \$289 plus \$5 shipping and handling each. (In N.J. add 6% sales tax.)
☐ Check Enclosed ☐ VISA ☐ MC ☐ AMEX ☐
 Account Number:
 NAME:
 ADDRESS:
 CITY: STATE: ZIP:
 PHONE: ()
 EXP. DATE (Mo./Yr.):
 SIGNATURE:
 Full refund within 30 days if not fully satisfied

CIRCLE READER SERVICE NUMBER 260

PC VIEWPOINT

Third-Party Pacts Could Ignite IBM's Desktop Publishing Sales



**BLUE
BEAT**

Deidre Depke

IBM's announcement last July that it had formed a unit to pursue the desktop publishing market created a resounding stir throughout the industry. The establishment of the Publishing Systems Business Unit clearly indicates that IBM has chosen to aggressively pursue a market that other firms throughout the industry have found both profitable and important.

IBM's flat sales in 1986 indicate just how much the company needs to build some momentum behind sales of its Personal Computers. And, there's no doubt that the corporate market's 1986 love affair with desktop publishing technology will continue. Market researchers estimate that 72% of Fortune 1,000 firms plan to buy an electronic publishing system this year.

Apple Computer, Inc. has demonstrated just how influential desktop publishing sales can be. Most large corporations with desktop publishing systems in-

stalled have purchased the Apple Macintosh as their hardware base. Through the sales of Macintosh machines, the technology of desktop publishing has succeeded in validating Apple's value to corporate America in a way that Apple's marketing strategies never could.

But IBM's success in the desktop publishing marketplace is hardly assured. For IBM to forge any real presence here it must overhaul some of its most basic business strategies, including the way it markets and sells products.

Part of Apple's success in the desktop publishing market is due to its formal and informal alliances with third-party developers. Aldus Corp. with its PageMaker and Microsoft Corp. with its Windows software packages were instrumental in developing the desktop publishing market and in establishing Apple as the clear leader in the field.

In fact, Apple has learned the value of third-party alliances so well that third-party developers say the software company will announce a formal relationship this month with Digital Equipment Corp. The two firms are expected to jointly market soft-

ware that allows the Macintosh and DEC VAX minis to communicate.

Given DEC's strength in mid-range system installations and Apple's in desktop publishing installations, IBM is faced with formidable competition for desktop publishing sales.

And IBM has made little headway in this battle. To date, the company has announced just one desktop publishing product — publishing software for the RT Personal Computer. Developed for IBM by Interleaf, Inc., the program is hardly attractive to the general market; it carries a one-time license charge of \$8,200.

IBM needs a hardware base

Before it can seriously gain a foothold in the corporate desktop publishing market, IBM must produce a hardware product base. The company needs both a laser printer and a Personal Computer AT enhanced with increased graphics capabilities. Although industry sources have predicted such projects for months, slow-moving IBM has yet to produce them.

But, more important, IBM must learn how to sell a desktop

publishing system — and that means forming alliances with third-party software vendors. Although the Microsoft MS-DOS version of PageMaker will certainly move MS-DOS PCs into the offices of desktop publishers, these buyers are just as likely to purchase a clone as they are to purchase an IBM product. For real success, IBM must follow Apple's lead and forge alliances with other key vendors of this technology and market a bundled system.

Last month, IBM did quietly endorse Windows and instructed its direct sales force to market the product to corporate customers.

But that's just an initial step. A bundled sales strategy is a bitter pill to swallow for IBM, one of the most protectionist of all computer firms. IBM rarely endorses other vendor's products, much less actively markets them.

IBM's success in the desktop publishing market also depends on its ability to sell this technology to corporate America. While the company can turn a portion of this responsibility over to its army of 2,300 computer dealers, much of its success in selling to

big business will depend on the efforts of its direct sales force.

That's the same direct sales force that has made something less than a spectacular showing in microcomputer sales to corporate accounts. Sources within the company report that IBM understands this and has made plans to form a division that will market new PC products to corporate clients. One of the group's first charges is to move IBM into the desktop publishing arena, these sources say.

That sales force will have another hurdle to overcome — user perception. There is hardly an artist, copywriter or designer in America who hasn't heard that Apple's Macintosh is the easiest, friendliest computer around. And those users have plenty of influence with corporate purchasers.

That means friendliness is a quality that Charlie Chaplin is going to have to develop.

Depke is editor of "IBM Watch," a biweekly newsletter to be published by CW Communications, Inc. "IBM Watch" will be dedicated to reporting and analyzing IBM news and trends worldwide.

WITH MCI® AND LOTUS®, WHAT YOU SEE



Introducing Lotus Express™ for MCI Mail®

you can send it. All with a few keystrokes.

Now you can send and receive graphics, messages, order forms, documents and files from any program in revisable form. Or spreadsheets like 1-2-3® with formulas and formats intact. Lotus Express runs in the background. It automatically picks up your mail and stores it on

Now the leaders in electronic mail and business productivity software join to help you realize the full power of your PC. With Lotus Express for MCI Mail, if you can create it,

PC VIEWPOINT

Desktop Publishing Foes IBM, Apple Face A Graphics Showdown



INSIDER

Thomas Roberts

By the looks of it, desktop publishing has descended on the personal computer industry like manna from heaven.

Take Apple Computer, Inc., for example. Desktop publishing is the application most often heralded for saving Apple from the ash heap of computer history. And just when it started to seem that a wave of consolidation was locking out small competitors in the PC software industry, along came innovative companies such as Aldus Corp. and Adobe Systems, Inc. These and other small companies are carving out market positions for themselves simply by offering better methods for placing marks on a page.

But with all the excitement about desktop publishing, it appears that we've lost a sense of perspective. At times, it seems as if the people touting desktop publishing would have you believe that virtually everyone in corporate America is really Gutenberg masquerading in a busi-

ness suit.

A central question is, How many people really need the capabilities of an entire printing plant sitting on their desks? Of course, for most folks producing manuals, newsletters and the like, high-level features are a must. But the real impact of the desktop publishing revolution is much broader and is already affecting most everyone in business. The broader implications are exemplified by the effect the Apple Macintosh has had on two very different but related areas.

The first is the improvement we have seen in the visual quality of general business correspondence during the past 12 months. The Macintosh and Apple Laserwriter are solely responsible for starting the trend toward business correspondence that goes beyond 10-pitch Courier print. You don't need a page composition program to make letters and reports look better; a simple Mac word processing package will do just fine.

Think about the number of letters, memos and reports you've seen recently that have headings highlighted by different fonts or type sizes. Before the Mac caught on, fancy stuff

— like a headline done in 14-point Helvetica type and surrounded by a box — had to be sent out to a typesetter. That option costs time and money, so no one with any business sense thought about lavishing different type styles on run-of-the-mill, in-house reports.

Everyday graphics

With the advent of the Macintosh, however, visual detail became easy to produce and commonplace. The Mac owes much of its success to the broader definition of desktop publishing that says that even simple enhancements are important to the look of printed matter.

With corporate politics and competitiveness being what they are, almost anything that is both easy to use and makes one memo seem more impressive than another is sure to catch on.

That brings us to the second impact of the Mac and desktop publishing. IBM Personal Computers and compatibles are being forced to adopt the same graphically oriented approach to displaying data that the Mac has espoused for the last three years.

One of the essential differ-

ences between a Mac and an IBM PC is the way each looks at objects on screen. The Macintosh treats all data on a display as a graphics image. As a result, charts and text can effortlessly coexist on the Mac's screen, and text attributes show up just as they will once they are printed.

In comparison, a PC treats text and graphics as separate entities; therefore, it is sometimes difficult to get the two to mingle on the same screen. When the PC was first introduced, the applications that demanded top priority were number crunching and text processing. Today, however, we are paying for the fact that the IBM PC cannot efficiently handle text and graphics on the same screen.

Some PC software vendors have made an attempt to get around the PC's graphical shortcomings. Several word processing programs — such as Lotus Development Corp.'s Manuscript and Microsoft Corp.'s Microsoft Word — attempt to show text attributes or graphics images on screen. But the problems with the PC's text and graphics integration go far beyond what tricky applications software can solve.

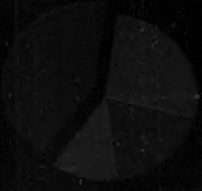
In its attempt to catch up to the Mac, it is essential that the PC adopt a graphically oriented operating system. PC windowing environments such as Microsoft Windows and Digital Research, Inc. Graphics Environment Manager (GEM) operate in graphics mode, thereby solving many of the problems mentioned here. But, no single windowing environment has won market dominance, and as a result, few applications have been written to run under these environments.

Until recently, that is. Two important page composition programs — Aldus's PC PageMaker and Xerox Corp.'s Ventura Publisher — are designed to run under Windows and GEM, respectively. Let's hope that these programs represent the first wave of software that will operate solely in graphics mode on the PC. For the scores of PC and compatible users, that ability would mean simple desktop features may soon be a reality.

Roberts is manager of personal computer research at International Data Corp., a Framingham, Mass.-based industry research firm.

IS WHAT THEY'LL GET. IN SECONDS.

Sales by Region



Percent of Sales

Product Features



your disk. It even signals when you have incoming mail, lets you access your messages without interrupting your program, and allows you to file all your messages in electronic folders. So the mail goes through, even while you're busy with other applications. You can transfer any file from PC to PC. Or send messages by postal, courier or telex delivery—anytime, anywhere—via MCI's worldwide communications network.

Lotus Express costs only \$100. At this price, your business can't afford not to have Lotus Express. And with the high cost of overnight delivery service, it can pay for itself in a few days—or less. Order now, and we'll give you a bonus—a FREE one-year subscription to MCI Mail.* A whole new level of productivity is just a phone call away.

Call today, toll-free, 1-800-345-1043.

COMMUNICATIONS FOR THE NEXT 100 YEARS.™

*Regular MCI Mail message charges apply. †Ask for #CM1757.

© MCI, the MCI logo, and MCI Mail are registered service marks of MCI Communications Corporation (MCI). COMMUNICATIONS FOR THE NEXT 100 YEARS is a service mark of MCI. © MCI: December 1986. * LOTUS and 1-2-3 are registered trademarks of Lotus Development Corporation. † Lotus Express is a trademark of Lotus Development Corporation.

CIRCLE READER SERVICE NUMBER 261

Now Computerworld puts a powerful new research tool right at your fingertips.

Computerworld's new SearchLink service gives you easy access to more than 800 databases in just minutes!

There's a wealth of useful information being gathered on electronic databases every day. But getting access to it hasn't been easy. What databases have the answers you need? How do you get access to them?

The answer is SearchLink. SearchLink gets you answers to all kinds of questions that are important to your business. You can get competitive information, or details about new products and services, or market facts, or the latest FCC regulations. You can get information on computers, finance, business statistics, investments, law and much more. Everything from accounting to trademarks to history or geography.

SearchLink offers you easy access to the services of leading database vendors including BRS; Dialog; NewsNet; SDC; VU/TEXT; and Questel, to name just a few. All you need is a credit card and a computer with modem.

All this, and more, with just one call!

SearchLink is easy.

No subscriptions. No passwords. All you do is call 800-843-7337 with your modem. Have your major credit card ready, and within a few minutes you'll be cleared to use SearchLink. Simple instructions tell you how to go after the information you need.

Using SearchLink is as easy as knowing what you want to find out. You pick the subject; SearchLink shows you what's available. Then you pick what you want to see.

If you know which database you want to access, SearchLink lets you specify that. If you're not sure, SearchLink can choose the database(s) to search.

SearchLink is inexpensive.

Considering that you could easily spend hundreds of dollars worth of your time with conventional research methods and still not get what you want, SearchLink could be the biggest bargain going. SearchLink costs only \$7.99 per topic searched (a few databases carry surcharges), plus 25 cents per minute connect time, and \$2 per abstract you choose to see. You can even get hard copies if you want them.

SearchLink provides 24-hour on-line assistance.

If you get into trouble, just type "SOS" and a real, live search specialist will come on-line to answer your questions.

Here's just a small sample of the databases you can access through SearchLink. A complete list is available on-line on SearchLink.

We can't list all of SearchLink's more than 800 databases, but just to give you an idea, here are *some* of the databases available under the topic "COMPUTER."

Business Software Database
Software Packages for Minis and Micros
COMPENDEX*
Engineering and Technology Information
Computer Database
Computers and Telecommunications
COMPUTERPAT
U.S. Data Processing Patents
INSPEC
High Technology Topics

Menu—The International Software Database
International Software Listings
Microcomputer Index
Business, Education, and Home Computer Topics
Online Microcomputer Software
Software Descriptions and Reviews
SUPERTech
AI, CAD/CAM, Robotics, and Telecommunications

And here are just a few of the other popular databases you can access with SearchLink:

ABI/INFORM
Business and Management Topics
Chemical Abstracts
Index of Chemistry Articles
Disclosure
(Selected Databases)
Donnelley Demographics
U.S. Census Information
Dun & Bradstreet
(Selected Databases)

ERIC
Educational Topics
PTS PROMPT
Business and Market Information
Standard and Poor's Corporate Descriptions
Information on U.S. Corporations
Trademarkscan
Active U.S. Trademarks
TRINET
Information on U.S. Companies

Here are some of the major database vendors accessible through SearchLink:

ADP Network Services
BRS Information Technologies
Data-Star
Datasolve Information Online
DataTimes Information Network
Dialog Information Services, Inc.

G-Cam Serveur
NewsNet, Inc.
Pergamon InfoLine
Questel, Inc.
SDC Information Services
VU/TEXT Information Services

Call 800-843-7337 now!

Put the power of knowledge to work for you right now. Call 800-843-7337 (THE-SEER) on your computer and get the answers you need to stay ahead.

SEARCHLINK

From Computerworld

Your link to the world of information.

COMPUTERWORLD

An International Data Group Service
SearchLink is sponsored by the National Federation of
Abstracting and Information Services.
NFAIS is a professional association of database producers.

A CWCI Publication
An International Data Group Company

NEWS ANALYSIS

Legal Hassles Hinder Micro Software Clone Business

While the hardware microcomputer clone market continues to move onward and upward, the young software clone market might already be in for a rough time. Litigation has been rearing its ugly head lately, and the scene is beginning to read like a who's who in copyright infringement cases.

"What you're seeing are some test cases in the courts that could make software cloning a dangerous business," concludes Paul Cabbage, senior industry analyst at Dataquest, Inc. in San Jose, Calif.

A recent court ruling in Broderbund Software, Inc.'s favor, stating that a competitor was offering a similar product that was too close to the "look and feel" of a Broderbund product, might

be a Pandora's box being inched open.

Into the legal breach has come Lotus Development Corp., which is suing both Paperback Software, Inc. and Mosaic Software, Inc. for having their software clones come too close to the look and feel of the 1-2-3 product.

If Lotus is using the trials as a means of frightening the competition away, however, it isn't necessarily working, at least in the Paperback case involving its VP Planner package.

"What this whole thing has given us is the opportunity to show how good our product [VP Planner] is," declares Adam Osborne, Paperback president. "[The case] might just work against Lotus."

If the ruling is in Lotus's favor, it could put a real damper on a new, growing, third-party software clone market that has been trying to finally break the price barrier of mainstream microcomputer software. Most of the software clones or compatibles on the market are priced well below the retail cost of the original products that, unlike the hardware market, have been unusually resistant to user pressure and competition to lower prices.

'In a funny state'

"The PC software market is in a funny state," Cabbage explains. "The clones copy the dominant [de facto] software standards out there because that's where the money is. But

that spells trouble now. On the other hand, there is little room for expansion into other, more innovative areas. Companies can't bring out a new kind of data base, for example, because the market is saturated."

The market, however, is changing, Cabbage says. Users are becoming dubious about high micro software prices and are more willing now to accept clones.

"When [Micropro International Corp.'s] Wordstar was a big seller, a few clones were being sold as work-alikes, but they didn't do well," Cabbage says. "They may have been ahead of their time."

In the meantime, some big name software vendors are getting into the clone market. Ash-

ton-Tate's Rapidfile is a paler version of the company's Dbase product that is attempting to head off some stiff competition from vendors such as Software Publishing Corp. with its PFS:File and Alpha Software Corp. with its Alpha Three.

Lifetree Software, Inc. has taken aim at 1-2-3 with Words & Figures, a low-cost compatible, and Lotus itself has reached agreement with Reading, Mass.-based Addison-Wesley Publishing Co. to produce a 1-2-3 clone aimed at the educational market.

"Clones can do well," Cabbage says. "Look at VP Planner; it's a best-seller. But that's also the reason it's drawn fire from Lotus."

S.K.

PERSONAL COMPUTER UPDATE

Laptop Units Set For Bullish Year

While the advent of Intel Corp. 80386-based computers garners its share of the trade press, the year of the laptop quietly unfolds.

Laptop portables are finally producing sales, and researchers are bullish. Dataquest, Inc. of San Jose, Calif., projects a five-year growth in laptop shipments from an estimated 400,000 units in 1986 to 600,000 units in 1987 to 2.4 million in 1990.

Why the sudden interest in laptops? Price for one. Laptops have been riding the price curve downward with all other personal computers.

Another reason is advancing technology. So-called supertwist screens improve on LCD technology by making the screens more readable; devices allow safe and easy data transfer between 3½-in. laptop drives and the conventional 5¼-in. PC drives; memory add-ins can push addressable memory up to 1M byte in some cases; and leaps in miniaturization enable inclusion of internal drives while still bringing the unit's weight down to around 10 pounds.

Tom Roberts, manager of personal computer research at International Data Corp. (IDC), a research concern in Framingham, Mass., says to look for good sales from Zenith Data Systems Corp.'s Z-181 and Toshiba America, Inc.'s T1100 laptops during 1987.

Though IBM has come out with enhancements to its laptop, such as an improved LCD with supertwist technology, optional 256K-byte memory card, it could be a slow year for the PC Convertible, which only

shipped about 23,000 units in 1986, according to IDC.

386 Industry Eyes IBM's Moves

The Intel Corp. 80386-based computer market continues to expand (see chart this page), but it has entered a lull, and all eyes are turned toward two players: IBM, with its imminent 386 machine, and Microsoft Corp., with its advanced MS-DOS system.

Rumors of IBM 386 prototypes being shown to select corporate customers keep circulating, but if IBM is set to launch its final version, the vendor is not letting anyone know.

There is a wait-and-see attitude in the world of IBM Personal Computer hardware clones. IBM's projected low-end PC clone buster is fast fading from the lips of industry observers who are now saying IBM will instead focus exclusively on the high-end 80386 market, leaving its old Intel 8086-based PC to die a natural death or be eaten by the clones.

Many say the clone market is about as tight as it can be now. Profit margins are being squeezed, and production crunches are resulting in delayed deliveries and angry customers. Leading Edge Products, Inc. and other vendors are discovering.

The entrance of Businessland, Inc. and Computerland Corp. chains into the clone arena is making it even tighter. With bargain basement prices hitting bedrock and more players coming in, shakeout might become a clone catchword.

Mart Shows Keen Interest In HAL

Perhaps the software product

that has grabbed the most attention lately is HAL, Lotus Development Corp.'s memory-resident package that works directly with its 1-2-3 to create and manipulate work sheets through English language phrases.

Tom Roberts, manager of personal computer research at Framingham, Mass.-based International Data Corp., and Susan Messenheimer, president of Natick, Mass.-based Artificial Intelligence Corp., see HAL as an important software product for different reasons.

Roberts thinks that HAL, along with other Lotus products such as Freelance and Manuscript, is a successful attempt by Lotus to build a fortress of products around 1-2-3 and keep the huge installed base of 1-2-3 users under Lotus's wing.

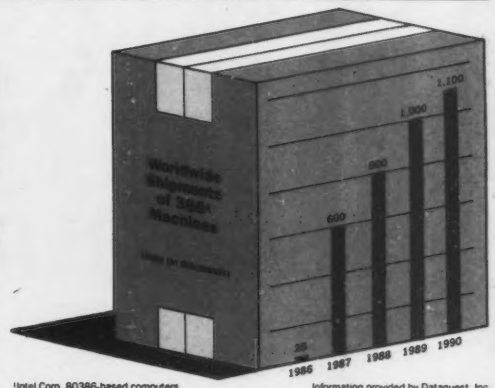
Messenheimer, however, sees HAL as the harbinger of the melding of artificial intelligence and micro software, which, to date, has been a failure.

"HAL," Messenheimer explains, "is an example of AI with a specific purpose in commercial use. It's a front-end Help package designed specifically for those thousands of 1-2-3 users who really don't know how to use 1-2-3."

Messenheimer says Lotus researched its user base and was surprised to discover just how many people were having trouble with 1-2-3. HAL, which works with English statements as does AI, takes users through the spreadsheet.

"What software vendors are finally understanding, and HAL is pointing out, is that users are not ready for a change in software architecture, which is what artificial intelligence has offered so far," according to Messenheimer.

"People can barely use existing software, and a new archi-



Intel Corp. 80386-based computers

Information provided by Dataquest, Inc.

itecture is too disruptive. HAL is a good introduction to artificial intelligence and will be the first of many embedded artificial intelligence software products that will serve as Help aids to existing software," she says.

VARs, Mail Order Hurt Retailers

There are some interesting changes under way in personal computer software and hardware distribution channels. Enter the age of the value-added reseller and mail-order firms (see story page 29) and the demise of the traditional retail outlets.

A switch in corporate purchasing habits is fueling the change, according to Steve Bosley, International Data Corp. analyst and manager of the Framingham, Mass.-based research house's VAR program.

"Mail-order purchasing satisfies the corporate craving for better deals," Bosley says. "and VARs satisfy their growing need to install complete solutions with vertical software applications. Retailers, whose overhead requires big markups and whose lack of expertise prevents them from competing with VARs, are

squeezed in the middle."

Jumping on the VAR bandwagon are vendors such as AT&T and ITT Courier Terminal Systems, Inc., which have rebounded from poor micro sales with retail outlets and direct sales forces and into more profitable VAR channels. Ironically, some clone makers might also find VARs a refuge from a clone market on the point of boiling over.

"Clones," Bosley says, "have been more accepted by VARs because VARs are selling more through solutions and not through brand names or price."

In the meantime, retailers see the writing on the wall. Bosley says some of the biggest retailers have been buying outside expertise and training in-house sales people to be more like consultants or, in Bosley's words, more like VARs.

Both the Businessland and Computerland stores are busy putting in place networking knowledge, vertical applications and direct sales forces.

This change is going to require a lot of resources and money, and only the biggest retailers can make the switch. For those that can't afford it, 1987 could be the year of the dog.

S.K.

NEWS ANALYSIS

IBM's Next PC Could Spell Doom For Microcomputer Managers

The industry is waiting for IBM's next-generation Personal Computer. While people speculate about its technical features, many analysts are suggesting that this PC will have more to do with marketing politics than technology; the product will be nothing less than a carefully calculated blow to micro managers.

By making micros an integral part of the mainframe world, IBM is placing them under the control of mainframe managers, to wit, MIS officers. At a time when micro managers are struggling to escape the power of the MIS world, IBM may have stepped in to effectively cripple the profession.

Why should IBM turn on the micro

professionals who have — far more than MIS — been responsible for introducing IBM PCs to the corporate world? The accepted wisdom is that IBM has set out to crush the micro managers because although they made the PC popular, they are now trying to get rid of it. Where MIS has a history of being true Blue, the micro professionals have discovered clones. It is micro managers who are leading their firms to purchase huge numbers of compatibles and to drain much-needed profits from IBM. So, IBM has set out to remove these managers.

At least, that's one theory.

Of course, it could be that all this speculation is pure paranoia. There is no

hard evidence that IBM is about to try to abort the emerging power of an entire profession. The 32-bit PC may indeed contain proprietary connectivity technology, but that content may be the result of nothing more than user demand.

Give users what they want

After all, micro-to-mainframe links are what buyers want. If, because of those links, micro managers become subordinate to MIS people, maybe that was inevitable, too. Maybe the inescapable result of distributed processing is that somebody has to become the person responsible for linking it all together, and that person might as well be the MIS officer.

Even assuming there is a deliberate IBM plot to overthrow micro managers, then the company would only be acting in its own best interests. It would be rewarding its loyal MIS customers and declining to pander to its bad. If any other company than IBM were to do the same thing, no one would raise an eyebrow.

IBM is on very dangerous ground no matter what it does. If it doesn't confront the clone makers and their best customers, the micro managers, it will continue to lose revenue at a time when it cannot afford to do so. On the other hand, if it too seriously wounds the micro community, Big Blue will win a Pyrrhic victory.

M.T.

NCC



WHAT'S IN IT FOR ME?

Quite simply, NCC '87 is THE conference that provides you with the knowledge you need to use technology to its fullest potential.

Only at NCC will you DISCOVER:

NEW TRENDS AND TECHNOLOGIES

Participate in highly targeted technical sessions led by industry experts on the newest developments, applications and directions.

NEW SOLUTIONS

Discover the answers to your specific computing needs at the most comprehensive business computer conference.

NEW PRODUCTS

Explore the latest hardware, software and communications innovations from more than 300 of the leading companies in the industry.

There is a need for one event to bring it all together and give you the chance to sort it out—that event is THE NATIONAL COMPUTER CONFERENCE.

Make plans now to attend.

The National Computer Conference
June 15-18, 1987
McCormick Place, Chicago, Illinois

Call 1-800-NCC-1987
or
return the coupon below.



Sponsored by:
AFIPS, ACM, DMPA, IEEE-CS, SCS

REDISCOVER NCC — DISCOVER THE POWER OF INFORMATION



For additional NCC '87 information, call 1-800-NCC-1987 or return this coupon to:
NCC '87, 1899 Preston White Drive, Reston, VA 22091

Name

Title

Company

Address

City State Zip

OR

Licensing On Site, Not On Target

Last year, after a long period of pressure from users, major microcomputer software vendors such as Lifetree Software, Inc., Lotus Development Corp., Ashton-Tate, Microsoft Corp. and others gave in. Copy protection was dropped altogether or embedded within site licenses.

Site licensing was something everyone thought users wanted because it would benefit users in two ways. First, it would enable them to make copies of programs and program documentation up to a certain number without crossing the line into illegal program copying. Second, it would enable users to avoid the high costs of buying single program copies.

The reasons sound good, but it appears that after a year, a lot of site licensing agreements remain virtually unused.

Lifetree Software, for example, says the response to its two-year license plan has slowed considerably. The company has lowered its copy number to 400 to help increase the number of users qualifying under the plan. Lotus also says its Multi-Value Plan license agreement has not had the support the firm expected.

Many large corporate users seem to be opting for individually tailored volume discounts instead of site licensing.

'That's all we need'

"We've agreed to buy at least 100 copies [of Lifetree's Volkswriter] a year at a discount," explains a departmental user at Citicorp in New York. "That's all we need. We don't need a large deal."

Criticism has also been aimed at site licensing plans considered too exclusive, catering only to the largest users.

"No wonder there's more interest in volume discounts," explains Julien Lange, president and chief executive officer of Ontio Computer Products Corp. of Cambridge, Mass. "The feedback we've had from corporate users large and small is that they don't meet the cutoff points for most site licenses. How many companies are going to need 500 copies of 1-2-3 for their analysts? What about the company that only has 10 analysts?"

Lange says he is one of the newcomers about to change that situation. Ontio's site licensing plan will discount its Ontio 259, a Lotus 1-2-3 clone whose single copies now cost \$29.95 with manual, to \$23.50 per copy to a maximum of 10; \$15 per copy to a maximum of 100; and \$13.40 per copy to a maximum of 1,000.

S.K.

NEWS ANALYSIS

'Superchips' Challenge The 386

Could the Intel Corp. 80386 and all the machines based on it already be obsolete?

In recent months, the computer world has been obsessed with the 32-bit Intel 386 and the emerging class of IBM Personal Computer-compatible machines that use it. As the 386 comes to market, however, so do a group of 32-bit reduced instruction set computer (RISC) processors, which far exceed the power of the Intel product.

In just the last year, Fairchild Semiconductor Corp., headquartered in Cupertino, Calif., shipped a microprocessor that displays large machine performance. The product is actually a chip set, collectively known as the Clipper, composed of two cache memory management chips and a CPU. The three are connected via twin 32-bit buses that allow extremely fast operation. The company claims that the Clipper is capable of sustained performance greater than five million instructions per second (MIPS).

Fairchild offers optimizing C, Fortran and Pascal compilers for the Clipper. It also markets a Unix-derived operating system, Clix, for the processor, and other operating systems may soon be available.

Where MIS fits in

Fascinating as these facts may be to computer designers, the Clipper becomes interesting to MIS only when it is incorporated into complete systems. Even then, the Clipper is most often considered a processor for technical and engineering workstations — machines far removed from real-life corporate DP.

But what the Clipper could mean to desktop computing can be seen in two add-in boards for the PC introduced at January's Uniform 1987, The International Conference of Unix Users.

One of these is the Series 300 Personal Mainframe from Cupertino-based Opus Systems. Essentially, the Series 300 grafts the Clipper onto a coprocessor board that plugs into a PC expansion slot. Special Opus software then converts the PC's native Intel 80186 into an I/O processor.

The resulting Unix-based hybrid is effectively a 32-bit workstation that Opus compares with a Digital Equipment Corp. Microvax. In OEM quantities, the Series 300 is priced at \$3,000 and up.

Another Clipper-based system is the Ziaaz 933 Computer Engine from Ziaaz International, Inc. located in Huntsville, Ala. Meant for Personal Computer ATs, the 933 is a two-board set consisting of a Clipper-based CPU and a memory board with 4M to 16M bytes of dynamic random-access memory. The \$9,750 933 converts the PC AT's Intel 80286 into an I/O processor in much the same way that the Opus system does.

Meanwhile, Sunnyvale, Calif.-based Mips Computer Systems, Inc. has been shipping a family of superchips, the RISC-based R2000 series, since March 1986. At their fastest, the chips are said to run at 10 MIPS. The chips already have buyers at Natick, Mass.-based Prime Computer, Inc. and Mountain View, Calif.-based Silicon Graphics Computer Systems. Some analysts call the workstations using these chips "personal supercomputers."

Mips sells its products in a number of different forms, depending on a buyer's needs. For the designer working on a board level, Mips provides component

kits consisting of little more than an R2000 chip. For the systems integrator, Mips has CPU boards. And, for the end user, complete systems are available.

Again, these are the characteristics of a scientific or engineering product and not an MIS-oriented machine. In fact, no one is currently marketing an add-in board for the PC based on a R2000 chip of any type. However, Mips's current line of CPU boards, which allow an integrator to build a computer by doing little more than adding a power supply and a chassis, provide a powerful model for building such a PC-based product.

Finally, the PC's long-term outlook may be seen in the recent 64-bit microprocessor debut from Weitek Corp. of Sunnyvale. In October 1986, Weitek announced the Accel group of microprocessors. The low end of these is the Accel 8000, a 32-bit machine that the vendor said provides a sustained speed of 5 MIPS and costs \$600 in quantities of 100. In the middle, at a cost of \$1,000 in quantities of 100, is the Accel 8032, a 32-bit processor with a 64-bit data path.

Both the 8000 and the 8032 were available to developers last year; this year, Weitek hopes to ship the Accel 8064. With three chips, the Accel 8064 will provide 64-bit processing with a 64-bit data path at a cost of \$1,500 in quantities of 100.

As impressive as these microprocessors are, they are not particularly exotic. In the not-too-distant future, CPUs will be based on really exotic technologies such as gallium arsenide semiconductors.

All of this would suggest that even the most advanced 386 machine is already obsolete. Increasingly, end users will have to decide whether it is wiser to purchase any PC based on an Intel product or go with a RISC-based workstation. Abandoning Intel might be particularly tempting now that such workstations can be easily cobbled together out of expansion boards and inexpensive PC clones.

M.T.

Developer Interest In Windows Piqued; Topview, GEM Struggle For Position

Microsoft Corp. has whipped up a whirlwind of interest in its Windows interface, but actual implementations of the product have yet to gain momentum. That appears to be the conclusion of industry watchers, though their perceptions on Microsoft's stronghold vary.

Microsoft has won the battle with developers, according to Robert Lefkowitz, an independent consultant based in Palo Alto, Calif. There are several Microsoft MS-DOS-based application vendors interested in Windows, he notes.

Even Apple Computer, Inc. Macintosh application developers are interested. According to Lefkowitz, three or four Mac package developers report that they plan to create Windows-based versions of their software for IBM PCs and compatibles. "With its graphic interface, Windows is the way to go."

Microsoft has a list of vendors who are planning to develop applications for Windows, says Walter Kozachek, an analyst with Delran, N.J.-based Datapro Research Corp. However, he cautions, "the question is if they'll actually write the applications. That is a big 'if.'"

A lot of developers are enthusiastic about Microsoft's product, but many others are not, Kozachek notes, attributing the disparity to the trade-offs of writing to Windows. Microsoft claims that vendors who write for Windows no longer have to worry about changes to MS-DOS because Windows will address those changes.

Windows applications harder to write

Application developers, according to Kozachek, feel that it is harder to write to Windows than it is to MS-DOS. "The learning curve is about two months," he says. "That's a lot of time."

Even if Kozachek does not feel Windows is a clear winner yet, he agrees that it is positioned better than such competing products as IBM's Topview and Digi-

tal Research, Inc.'s Graphics Environment Manager (GEM).

Digital Research is a jump ahead of Microsoft and Windows, Kozachek says, because it already has a version of GEM for the Intel Corp. 80386. However, Microsoft reportedly has a 386 version of Windows ready or near completion, Kozachek adds.

Getting to market first with a 386 windowing interface is a feather in Digital Research's cap, but the company does not have the marketing resources of Microsoft. "Microsoft is behind Windows, and it's controlling MS-DOS, the dominant operating system for Intel-based computers," Kozachek says.

"Many vendors are banking on Microsoft to make Windows compatible with the Intel chips and MS-DOS," Lefkowitz agrees. "Developers are largely going on Microsoft's reputation." Moreover, Microsoft has the money and clout to push Windows as a standard, notes Frank Wirsh, a research analyst with San Jose, Calif.-based Dataquest, Inc.

Topview drawbacks

The view is less optimistic for Topview. While IBM has plenty of money and clout, it does not have a competitive windowing interface. "Topview has not been received well at all," Kozachek says. "If Windows is clumsy, Topview is clumsier. Not many vendors are interested in it." Also, IBM only offers Topview on a limited basis, he notes.

IBM may choose to develop a graphics software interface based on Topview, according to Lefkowitz. "If IBM is smart, it won't call the product Topview. That has a bad name in the marketplace."

Even with a proprietary interface, however, there is enough momentum behind Windows that the IBM graphics environment will have to support it, he speculates.

R.H.

The World's First Software "ROBOT"

AUTOMATOR mi — the superhuman PC "expert" that monitors the screen, keyboard and internal clock of an IBM PC with lightning reactions and speed, perfect typing and a faultless memory.

— It can "drive" your PC unattended, "wake up" at a preset time, run the mainframe link, transfer files from the remote mainframe to the PC, then log-off again.

— It can be taught to log-on (or off) with most communications cards at the user's request. Since it can read the screen and make decisions, the process is as quick as the mainframe can handle it.

— It can transfer mainframe data by going through the original database, "reading" each record from the screen and then "typing" it into the new database.

— Best of all, **AUTOMATOR mi** never calls in sick; it doesn't take coffee breaks or vacations... and it never gets the blues!

AUTOMATOR mi — It has a thousand uses to enhance your micro/mainframe applications and make your life easier! Take a closer look.

INTERACTIVE SOLUTIONS, INC.
53 W. Fort Lee Road, Bogota, N.J. 07603
(201) 488-3708 (212) 475-2400



AUTOMATOR

NEWS ANALYSIS

Microsoft, Interactive Cooperate On Xenix Hybrid For The 386

Microsoft Corp. and Interactive Systems Corp. have embarked on a path of greater cooperation in the Unix market with a joint development and marketing pact.

According to the agreement, Microsoft and Interactive will cooperate in developing a version of Microsoft Xenix based on AT&T's Unix System V.3 for the

Intel Corp. 80386 processor. This version will reportedly retain Xenix's Microsoft MS-DOS application development capabilities and support the VP/IX MS-DOS emulation software developed by Interactive and Phoenix Technologies, Ltd.

Some in the industry question how compatible this hybrid

Xenix will be with the current Xenix-based applications running on thousands of personal computers from vendors such as IBM, Tandy Corp. and Altos Computer Systems, Inc. The ultimate Xenix product should offer full backward compatibility with both Xenix for the 80286 and 386 as well as AT&T Unix

V.3, according to Betty Niimi, Interactive's vice-president of systems development.

However, compatibility has different meanings, says Doug Michels, vice-president of the Santa Cruz Operation, Inc., which also has cooperative Xenix marketing and development agreements with Micro-

soft. Xenix has always been source code compatible with other implementations of Unix, he notes. With source code compatibility, applications must be recompiled to run.

The hybrid Xenix for the 386 will be binary compatible with AT&T Unix System V.2-based Xenix for the 386 due later this year, Michels states. This binary compatibility will allow applications to run directly on either version without recompilation.

Meg Lewis, vice-president of Dallas-based consulting firm Future Computing, Inc., questions whether the hybrid Xenix can really provide full backward compatibility with Xenix or Interactive's PC/IX. There are many incompatibilities among the Unix versions, she says.

With some tough problems ahead and limited compatibility, why is Microsoft developing the hybrid Xenix with Interactive? Xenix is being redesigned so that it is compatible with future versions of AT&T Unix, according to Michels. "AT&T Unix V.3 is a fairly extensively modified version of Unix. It has been separated into modules for easier expansion down the road." The impact of the hybrid Xenix version will be seen in the future rather than today, he says.

Also, there are large numbers of corporate users with Xenix, according to Bruce Kin Huie, a senior analyst with Framingham, Mass.-based International Data Corp. Microsoft needs to keep these users by providing application portability and adhering to evolving Unix standards, he says.

A contender on the scene

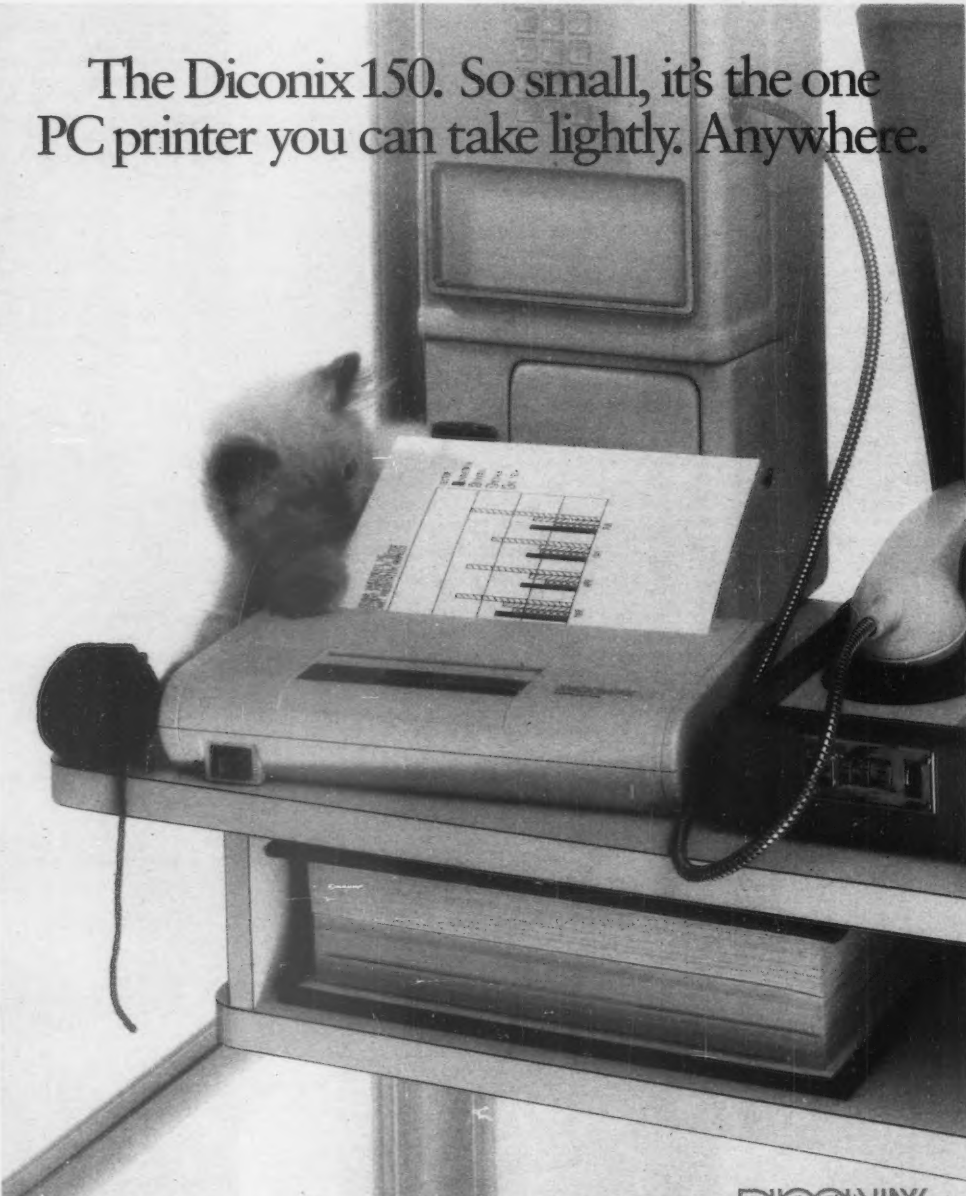
One factor troubling Microsoft is competition from Microport Systems, Inc. (working with Locus Computing Corp.), which has unveiled Merge 386. The 386 operating system offers coresident MS-DOS and Unix System V.3 and costs a few hundred dollars less than Xenix.

Microport also appears to have time on its side. Reportedly, Merge 386 is ready and waiting for AT&T's certification while the availability of the Xenix hybrid is a larger unknown. Microsoft and Interactive's announcement was merely a statement of intent, and the vendors have not publicly agreed on an introduction date.

Perhaps one sure thing is the validity of such an agreement. "It makes sense for the major players in the Unix market to cooperate," Future Computing's Lewis concludes.

R.H.

News Analysis section written by Computerworld Focus staff members Stan Kolodziej, Michael Tucker and Rebecca Hurst.



The Diconix 150. So small, it's the one PC printer you can take lightly. Anywhere.

See Us At Hannover Fair, Hall 4 Upper Floor E34/F33

DICONIX

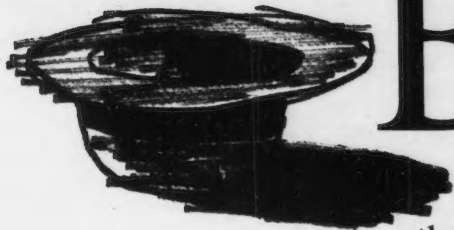
A Kodak Company

3100 Research Boulevard
Dayton, Ohio 45420.

For the dealer nearest you, call
1-800-DICONIX Telex: 288-280

VENDOR ANALYSIS

Is IBM In The PC Business?



IBM's plans for its PCs may be the best kept secret in the industry, but three top consultants — Brian Jeffery, Jan Lewis and Amy Wohl — will help unravel the mystery with their predictions.

BRIAN JEFFERY:

IBM's plans for its Personal Computer line amount to nothing. Big Blue has ostensibly gotten out of the PC business and is focusing on the workstation arena.

IBM is working on a generic set of workstations, some of which are intelligent (that is, run DOS in ASCII mode), and all of which share the same hardware and much of the same functionality.

This workstation line is built around IBM's 3270 standard, and most of the dumb versions of the line have already been introduced during 1986 as the 3193, 3194 and 3196.

IBM's Communication Products Division out of Raleigh, N.C., is performing the work on these machines. The once-proud Entry Systems Division is now little more than an appendage to the Communication Products Division and looks after details like hardware engineering and talking to software developers.

IBM has organizationally already merged the PCs with its line of 3270 terminals; product

mergers will follow. In 1986, the architectures, software components and functionality of IBM PCs were redefined in eight sets of announcements that essentially covered IBM's entire mid-range, workstation and local-area network (LAN) lines.

IBM has come a long way.

The company entered the PC market in 1981 as part of a series of entrepreneurial diversifications. Its independent business unit strategy was fashionable then, and the new Entry Systems unit was given free rein to develop and market its own product. Entry Systems and PCs were IBM's great successes.

By 1986, IBM had shipped more than three million PCs, PC XT's and AT's, the vast majority of which were shipped in the U.S. to Fortune 2,000 users who formed the backbone of IBM's large systems markets.

In the process, the IBM PC line has become a workstation standard. Purchases of PCs by large users have exceeded purchases of dumb and low-cost

VENDOR ANALYSIS

3270 terminals.

Of equal significance is that since its debut, the PC has nurtured a new set of users — managers, professionals and administrative personnel who had never been users of dumb terminals.

PC base key to IBM strategy

The PC's base has become immensely significant to the whole of IBM's strategy. The development of complex networks,

the use of mainframe systems, the concept of departmental computing and the advent of LANs are going to be increasingly dependent on the individual workstation user, and that user had become a Personal Computer user.

Today, IBM's objective is to incorporate PCs, as workstations, into a broader environment.

The PC is the point at which a user gains access to the full

range of information processing resources available within a large organization's network. Everything IBM offers, its full range of standards and architectures, services and types of information, must all be accessible from the PC.

For users and MIS, IBM's thrust means the Personal Computer line will feature support for the following:

■ Advanced 3270 Systems Network Architecture (SNA).

IBM is referring to this complex when it talks about comprehensive electronic documents. This complex include support for LU6.2 as well as image, text, voice, graphics and programmed symbol sets.

Despite the science fiction sound of such claims, IBM can reach this point. During 1986, IBM brought in its 3117 and 3118 scanners, which handle input of images to PCs and to the latest 3270s.

Voice was given a trial run with the PC Voice Communications Option introduced in 1985.

PC Voice did not catch on, however, and IBM appears to be trying a new approach in that technology this year. Whereas PC Voice was primarily connected to the System/36 in the IBM Distributed Office Support System environment, the new PC Voice approach will be more closely linked to the 9370/VM environment and the Token-Ring and the Rolm Corp. CBX 3 private branch exchange.

IBM is still weak in the area of color graphics, but next-gen-



One Size Fits All.

If your company has multiple computer types, getting graphics from brand X to brand Y creates big problems.

It's a very people intensive process. Metafiles are usually very computer dependent. It could take hours, days, even weeks to move all that complex data to the computer where your hard copy devices exist.

But not with UNIRAS software. We developed a system that allows us to store all the numbers and high tech wizardry involved in doing graphics within the constraints of a text file. It's called a UNIPIC file.

Just push a button to store

your picture into a UNIPIC file. Push another button and zap it from brand X to brand Y. It's that simple.

That means you can now create graphics on your workstation or IBM PC AT and send them to the mainframe for hard copy—without having to know anything about the mainframe.

Consequently, it saves you a bundle in time and money. And makes hard copies better and faster. It runs on about 30 different computers, too.

And unlike the competition, our entire product line runs on the IBM PC AT as well as mainframes. Which allows you

to move your data down to your IBM PC AT and completely divorce yourself from the sluggishness of an overloaded mainframe.

So if you want to create pictures on any computer type easily with full transportability, get the one graphics software package that fits all. UNIRAS. For more information, call (214) 980-1600. Or Write UNIRAS, 5429 LBJ Freeway, Suite 650, Dallas, Texas 75240.



CIRCLE READER SERVICE NUMBER 265



Brian Jeffery

eration Personal Computers should have the ability to talk between the PC's Enhanced Graphics Adapter and IBM host graphics under the Graphical Data Display Manager. Programmed symbol capability, under 3270 protocols, should permit users to utilize light pens, mice, tablets and the like to add scratch-mark information onto text and image documents.


The key feature of these capabilities is that they are integrated under IBM's SNA, which means that it will become feasible for users to create, edit, file and transmit documents incorporating the different types of information.

When the IBM scenario is complete, these Personal Computer capabilities will be fully supported by corresponding software applications on mid-range systems (including the 9370 and the latest System/36 and 38 models) and mainframes. The PC will support this multi-level complex to the same extent as the latest 3270 devices introduced in 1986.

■ **Enhanced Connectivity Facilities.** In 1986, IBM introduced the Enhanced Connectivity Facilities for applications linking Personal Computers, mid-range systems and mainframes and as the main axis for coprocessing between PCs and larger systems.

In an initial form — the Host Data Base View product — the offering is being implemented to support data transfers between IBM's relational data base management systems — DB2 (on mainframes) and SQL/DS (on 9370s) — and leading PC software applications such as Lotus Development Corp.'s 1-2-3, Ashton-Tate's Dbase line and

**SIT BACK, RELAX,
AND GET DOWN
TO WORK.**



Go ahead. Put your feet up, tilt your chair back, and pull out the latest issue of **COMPUTERWORLD**. No one will mind. Because you're doing your job! **COMPUTERWORLD** is mandatory reading for MIS professionals. Indispensable.

51 weekly issues, plus 12 issues of **COMPUTERWORLD FOCUS**, for only \$38.95. That's over \$5 off the basic rate!

COMPUTERWORLD
Keeping Up With Today.
Anticipating Tomorrow.

Fill out and mail in the attached postage-paid envelope.

Please enter my subscription to **COMPUTERWORLD** at the low Special Introductory Rate of just \$38.95 for 51 issues — a savings of \$5 off the basic rate. Plus, I'll receive the **COMPUTERWORLD FOCUS** issues FREE with my subscription.

☐ Payment enclosed
☐ Charge my credit card
☐ Bill me ☐ AmEx ☐ VISA ☐ Mastercard

Signature _____ Card Expires _____

FIRST NAME																MI																LAST NAME															
TITLE																																															
COMPANY																																															
ADDRESS																																															
CITY																																															
STATE																																															
ZIP																																															

Address shown: ☐ Home ☐ Office
☐ I'm already a subscriber, but I'd like to extend my subscription at this special low rate. (Attach mailing label above.)

Canada: Central & South America \$110/ Europe \$165/ All other countries \$245 (Airmail)

Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for the special introductory rate

COMPUTERWORLD

Basic Rate: \$44

Detach here, place in envelope, and seal securely.

Please indicate your business, function, and computer involvement below.

- 1 PERSONAL USE (Circle one)
 19 Manufacturer (other than computer)
 20 Financial/Insurance/Real Estate
 21 Wholesale/Retail Trade
 22 Other
- 2 BUSINESS USE (Circle one)
 30 Business Service (except DPs)
 31 Public Utility/Communications Systems
 32 Transportation
 33 Manufacturing
 34 Research/Development
 35 Computer-Related Systems or Equipment
 36 Computer Service Bureau/Software
 37 Computer Peripheral Dealer/Distributor/Retailer
 38 User/Other (Please specify)
- 3 FUNCTION (Circle one)
 40 President/Asst. VP
 41 Vice President
 42 Dr. Mgr. Supv. of Operations
 43 Planning/Adm. Services
 44 Systems
 45 Dr. Mgr. Supv. of Programming
 46 Computer Programmer/Analyst
 47 Data Comm. Network Systems Mgt
 48 Data Comm. Network Systems Mgt
 49 President/Owner/Partner/General Mgr
 50 Vice President/Asst. VP
 51 Vice President/Asst. VP
 52 Engineering, Scientific, R & D, Tech. Mgt
 53 Manufacturing Sales Reps./Sales Mktg. Mgt
 54 Manufacturing Sales Reps./Sales Mktg. Mgt
 55 Consulting Mgr.
 56 Medical/Legal/Accounting Mgt
 57 Medical/Legal/Accounting Mgt
 58 Other
- 4 COMPUTER INVOLVEMENT (Circle all that apply)
 Types of equipment with which you are personally involved:
 A. Microcomputers/Small Business Computers
 B. Minicomputers/Small Business Computers
 C. Mainframe Computers
 D. Communications Systems
 E. Other Automation Systems
 F. No Computer Involvement

3317-6537

VENDOR ANALYSIS

Microsoft Corp.'s Multiplan.

Lotus, Ashton-Tate, Microsoft and numerous other PC vendors will be working to support IBM standards, ultimately allowing PC users to effect two-way file transfers and data dumps between IBM DBMS environments and programs running on PCs under Microsoft MS-DOS. The Enhanced Connectivity Facilities product standard will also be extended to handle a range of transformations between PC- and IBM systems-based data formats.

■ PC support. "PC support" is a generic term for IBM software and standards permitting PC users to maintain virtual disks and diskettes on larger IBM systems, initiate mainframe or departmental system applications and use various decision support facilities.

Worth noting is that MIS and users now have a range of IBM products, such as PC Support/36, PC Support/38, VM PC Bond on the 9370 and Enhanced Connectivity Facilities on mainframes, that give PC users the ability to use large systems capability as an option to perform tasks locally under MS-DOS.

■ Windowing. When IBM talks windows, the company is not thinking about MS-DOS 4.0 or 5.0 or whatever else Microsoft may be cooking up. The IBM version of windows was originally offered on the 3270 Personal Computer and involves the ability to run multiple host sessions on a single workstation.

These sessions are reflected in multiple on-screen windows between which the user can adjust and transfer data. IBM's emphasis is on windows that contain data from different systems rather than from different MS-DOS sessions. Users can achieve this setup if they load microcode into the workstation (as IBM has done with the 3270-PC and with its latest 3270 terminals). IBM will include this feature in its next-generation PCs.

■ The Token-Ring Network. IBM's much-vaunted LAN is not doing well in the market, but this is not a major factor for IBM. Big Blue has never liked the idea of stand-alone LANs; what IBM did with the 9370 is representative of its strategy in the Token-Ring area.

Users may attach the Token-Ring Network via an integrated I/O adapter on a 9370. The Token-Ring becomes a means of attaching PCs to a 9370, which acts as a server, and the LAN and departmental system are effectively bundled. IBM, of course, would much rather sell a mid-range system with all the trimmings than a LAN, which consists of adapters, software packages and wires. For IBM, supporting the Token-Ring on PCs is a means of selling 9370s, not Token-Rings.

The effect of this approach is that IBM is reducing PCs to the status of network workstations,

distinctive in that users can also utilize them to run ASCII DOS applications but otherwise part of a generic set of IBM workstation offerings. PCs will become the same as 3270 terminals, except that 3270s cannot run PC software.

Anyone who wishes to know what next-generation IBM PCs will be like has only to look at what IBM has been doing with the 3270 line, which has 3270-format CRTs with multiple windowing SNA, programmed symbols, support for the 3117 and 3118 scanners and diskette-loaded microcode.

Add an ASCII DOS box with an Intel Corp. CPU to a 3194 or a 3196 terminal and one has a reasonable approximation of next-generation IBM PCs. Add to that software that gives the individual a direct hook into larger IBM systems, and the picture shapes up.

IBM's design parameters for PCs no longer focus on the original Intel/Microsoft architecture but rather on the accessibility of network facilities derived from SNA, the 370 architecture and the rest of the mainstream IBM product complex. The ASCII DOS component remains as an open architecture, but it is an exercise in tolerance rather than commitment.

In IBM's view, that component is for those who still wish to run their personal applications on their personal machine. But the way IBM sees it, there will be fewer and fewer such users. Users will spend less and less time on personal applications and more and more time on-line to other systems in a network. And, who knows, maybe one day the habit of running DOS will die out altogether.

JAN LEWIS:

If you think IBM has lost control of the Personal Computer market and the market can only look forward to following a different leader, think again. 1987 may bring some surprises.

IBM would rather forget 1985, a time marked by sinking stock prices, dismal earnings, early retirement plans and ever-increasing competition in the low-, middle- and high-end product lines.

The last few years have been tough for IBM. The company made no moves to block the clones through either a price or hardware lockout. No long-rumored, next-generation PC materialized. Even Apple Computer, Inc. was putting pressure on Big Blue, entering IBM's corporate pasture in desktop publishing clothing.

Compaq breaks with tradition

Compaq Computer Corp. broke with its tradition by not

waiting for IBM to announce an Intel Corp. 80386-based PC before announcing its own. PC clones were everywhere from large outlets like Computerland to mail-order marvels and kitchen table entrepreneurs. Mass-market masters like Atari Corp. and Commodore Business Machines, Inc. announced their own clones.

The bottom line clearly reflected the results of these forces. IBM's prices eroded and the company's share of the PC market went with them. Even more importantly, IBM appeared to be a sluggish bureaucracy unable to fight back.

However, because IBM is so large (even in bad times it grossed \$51 billion), analysts underestimate its agility and power to react. Historically, IBM has responded to a crowded



Jan Lewis

market by leapfrogging to a new generation of technology, using its considerable manufacturing and silicon muscle to cut costs and dramatically raise functionality. The erosion of its PC market indicates to me that the time is right for drastic action. The most frequently mentioned solution is to close the PC. However, the clone market has enough momentum that such action might not be effective, and even worse, it could split standards and weaken the overall market.

A proprietary disaster

If IBM buried enough of the operating system deep in read-only memory or silicon to prevent legal emulation, it would follow the strategy of companies like Apple. But again, the market momentum is so strong that closing the PC just to prevent its reproduction could be a disaster. A proprietary PC must offer better functionality for IBM to recapture its market lead.

Last year's reorganizations and early retirement plans (with another 5% of IBM employees scheduled to retire in 1987) may appear to be merely cost-cutting moves, but the results will have even greater impact. These moves allow IBM to change its sales strategy and become more reliant on third-party resellers.

IBM's traditional methods of selling have become too expensive. As technology ushered in low-priced, mid-range systems and inexpensive PCs, small systems were unable to support the hand-holding and long sales cy-

cle used in the large and mid-size system areas. And that area is exactly where the geographical reorganization of sales should pay off for IBM in 1987 and beyond.

To help it sell more efficiently, IBM has moved considerable resources and responsibilities from its direct sales force to third parties like value-added resellers, systems integrators and turnkey software vendors. Programs for cooperation can replace and supplement high-cost direct sales techniques and system support. In this manner, IBM is actually moving closer to smaller systems and small-size customers rather than backing away from them.

IBM may surprise you

As the stand-alone PC evolves into a networked microframe, users will demand more support services, ranging from installation to system management, which are IBM's strong points. With the help of third parties, the company will be able to deliver support at a price justified by the lower cost systems. Vendors that expected less competition from IBM because of the company's cost-cutting, may come across just the opposite.

IBM has not been able to compete with the clone makers — even though the company now primarily assembles its machines from the same sources. IBM may reverse this strategy in the future, however.

Although the Japanese were expected to be the chip leaders, IBM was not only the first to offer 1M-bit dynamic random access memory (RAM) in a mid-range product but has already announced the next generation. The memory-hungry desktop publishing and artificial intelligence applications areas will welcome a cheap 1M-bit dynamic RAM chip.

What had appeared to be IBM's greatest weakness could be its greatest strength. But don't expect IBM to be the lowest cost supplier. The best strategy is to use the low-cost production to offer the most functionality for the price.

IBM has done it before. I look for improved functionality once again to be IBM's best defense and offense. Besides more bandwidth, storage and peripherals for the dollar, that functionality will be delivered by connectivity — and connectivity can solve the problems of price and cloning.

IBM is first and foremost a systems company with the ability to provide and manage the interconnection of different levels of hardware, software and peripherals. I look for IBM to implement in silicon LU6.2, Systems Network Architecture support, networking, Advanced Program-to-Program Communications (APPC) and protocols. Silicon brings the vital benefits of lower manufacturing costs and proprietary protection. Silicon

raises the manufacturing ante far beyond the stakes of the average clone vendor and leaves these firms legally vulnerable.

In the future, buying a desktop microcomputer without built-in LU6.2, APPC and Token-Ring support will be like buying a telephone without a standard RJ-11 jack. Combine this universal connectivity with the power of an 80386-based system or IBM RT Personal Computer engine, and Big Blue could jump over its competitors and set the standards for price, performance, connectivity and distribution.

So, those who believe that IBM is too big to be competitive from the mid-range on down may find 1987 to be an interesting year indeed.

AMY WOHL:

The personal computer industry was largely built by IBM. But Big Blue has left the PC marketplace in a lurch lately. Intel Corp.'s 80386 processor technology is here, but not for IBM-faithful PC buyers.

Other vendors, convinced that IBM will follow established rules to stay in a game that Big Blue no longer entirely controls, have been unwilling to wait. They have jumped into the marketplace with 80386-based products that assume the next generation of personal computers will be more of the same — bigger, faster, more capable but firmly rooted in IBM-defined origins.

In fact, competitors have already placed big bets in the 386 sweepstakes. They are gambling on certain positions:

■ That IBM has no choice but to follow the open PC hardware and software standards with which it has already been so successful.

■ That customers will rebel and buy from the 386 standard-bearers if IBM created a new PC environment.

■ That IBM has a stake in the continuation of an orderly market of multiple, successful PC-compatible and clone vendors because it is the combination of the IBM PC market and this compatible/clone market that entices the continuation of a rich third-party market in IBM PC-based hardware and software.

■ That IBM wants and needs to stay in the personal computer business — that is, the business of selling individual PCs into a competitive market in which others sell similar or identical products on a highly price-oriented basis.

I see it differently.

IBM has been telling analysts and customers for some time that it will withdraw from the PC business or the appropriate

VENDOR ANALYSIS

parts of the market should the business reduce itself to a price-only decision. IBM may want to be the low-cost producer in the markets it pursues, but it also needs to make its traditional margins.

This scenario seems to suggest that IBM will grow less and less interested in the commodity part of the market and move toward a strong emphasis on high-end personal computers. But IBM must be mindful of the fact that high-end computers will stay profitably priced only if the commodity discounters stay out of that market.

There are only a few ways that IBM can keep these discounters at bay:

■ **Create legal barriers.**

Close the IBM machine with proprietary hardware and software and protect it by legal barriers such as patents and copyrights. However, this strategy could

mean an end to third-party hardware and software, both of which have contributed significantly to IBM's success.

■ **Use fast-changing technology.**

Close the IBM machine by using proprietary, custom, very large-scale integration technology and change the technology often enough so the clones cannot follow. But it seems unlikely that IBM can move as fast as it would like. Speed and flexibility are the advantages of the young and small — and IBM is neither.

■ **Push a new operating system.**

Close the IBM machine by using a new, proprietary or IBM-controlled operating system. IBM would enjoy this plan, especially if Big Blue could accomplish this through MVS. It could offer a single operating system from workstation to large mainframe, thereby giving the company opportunities to engage its rival Digital Equipment Corp. in a new dance.

However, this situation seems unlikely. It would cost IBM considerable capabilities in the area of ongoing software development. In fact, PCs may be fated to be sin-

gle-user machines, in which case MVS would be an entirely inappropriate environment however compatible it might be with larger systems.

Now, the Conspiracy Theory from the Society of Paranoid Competitors says that the long wait for an IBM-labeled 386 PC is simply a plot. It is IBM's intention, this story goes, to wait until all of its competitors have bought the Compaq Computer Corp. Theory of the Universe, which relies on the premise that IBM has established a standard and, having established it, must never stray for fear of losing its market. And when all of IBM's competitors have invested their money in products and documentation and marketing campaigns, then, and only then, will IBM strike, announcing a machine that puts them all out of business.

Of course, this theory has a few holes in it, too.

Because IBM is too big and too structured to be very flexible, whatever it has decided to do about 386 machines was decided a long time ago, presumably before any 386s were announced. Therefore, IBM is not susceptible to much change in either product content or timing.

It is IBM's competitors that have the flexibility to take advantage of marketplace changes — not IBM.

IBM is bound by the success of its PC-DOS standard. Any system the firm offers based on newer technology will, out of necessity, have to support older PC-DOS programs and will be compatible with the early 386 offerings at some level.

A two-flavor machine

IBM could choose to offer a two-flavor machine with PC-DOS and something else. In fact, I suspect it will. But if all the exciting new software and all the established old software run on the PC-DOS side, IBM will have to do something spectacular with the proprietary side of the machine to find a strong marketplace.

Most likely, this situation will point in the direction of upward integration with larger IBM systems (the market IBM cares about) and will not necessarily matter much to IBM users who buy PC-DOS-compatible local-area networks as their integration schemes. This scheme would leave plenty of room for IBM's competitors to maneuver. Compaq, with its success in large, IBM customer organizations, would probably be the vendor most affected.

Taking heart in hand, I predict that IBM will announce a 386 machine in 1987, that it will not deliver that machine in quantity during the first half of this year, that the machine will run both current PC- and MS-DOS software faster but otherwise not remarkably differently and that IBM will offer an environment designed to have special appeal to large IBM mainframe customers.

And there's certainly nothing surprising here. In fact, the IBM 386 announcement is likely to be the biggest anticlimax of 1987.

Go ahead, IBM — Surprise me! Please, do something else! [E]

Jeffery is managing director and co-founder of Los Altos, Calif.-based International Technology Group, a computer industry research firm.

Lewis is president of the Palo Alto Research Group, a market research firm based in Palo Alto, Calif.

Wohl is the president of Wohl Associates, a consulting firm located in Bala Cynwyd, Pa.



Amy Wohl



KNOWLEDGEMAN/2 LETS YOU GET TODAY'S WORK DONE AND PLAN FOR TOMORROW.

KnowledgeMan/2® the most advanced business software available, lets you be more productive than ever before and in less time.



These powerful business capabilities, tightly fused into a single program, work together for you:

- ☐ Relational data management
- ☐ Spur-of-the-moment inquiry
- ☐ Spreadsheets
- ☐ Statistical analysis
- ☐ Forms management
- ☐ Programming language
- ☐ Options for creating graphs, processing text, generating reports, painting forms, mouse processing and remote communications.

KnowledgeMan/2's four user interfaces make it easy for you...and all your business people...to work with KnowledgeMan/2:

- ☐ Menus, help screens and easy-to-use documentation guide your every step, if

you're just beginning.

- ☐ Direct commands for the power user, with help available when you want it.
- ☐ K-Chat, the optional natural language interface, for asking for information in plain English.
- ☐ Procedural programming for the advanced user

Get KnowledgeMan/2 working for you today. And start planning for tomorrow.

KnowledgeMan/2 is available for the IBM PC, PC/XT, PC/AT and compatibles. Multi-user versions are offered for the DEC VAX system and 3Com, Novell and IBM PC local area networks.

Your local mdbs sales representative can provide additional information. For the location of the sales office nearest you, call or write mdbs.

mdbs and KnowledgeMan/2 are registered trademarks and K-Chat a trademark of mdbs, Inc. "VAX" is a registered trademark of Digital Equipment; "PC/XT" and "PC/AT" of IBM Corp.; 3Com of 3Com Corp.; Novell of Novell, Inc.

**KNOWLEDGE
man/2**
THE UNIVERSAL KNOWLEDGE MANAGEMENT SYSTEM

mdbs/Marketing and Sales • P.O. Box 248 • Lafayette, IN 47902 • 800/344-5832 • 317/463-2581 (Indiana, Canada)



IMPLEMENTATION TACTICS



So, You Want To Be A Beta Site?

BY • STAN • KOLODZIEJ

In this age of vaporware, delayed product announcements and product recalls, personal computer hardware and software vendors are under the gun to produce more trouble-free products before they're shipped to commercial users.

Beta testing is an important avenue for vendors to achieve a more finished prerelease product. Vendors are keen on beta sites because they can better simulate true working conditions to test products. They can also gather beta results to iron out problems that were overlooked or did not appear in their development cycle.

The users of beta products also benefit. They can get a jump on other users (and competitors) with upcoming offerings. They can also cement close relationships with vendors during the beta phase that can pay dividends later with discounted software and extra support.

But beta testing is hardly a path strewn with roses. At best, it is still a trade-off, with any benefits gained by the beta user tied closely to the amount of work and resources put into the testing. At worst, it can be an experience ending in frustration for both parties.

"All I can say is if you are thinking of becoming a beta test site user, you'd better be prepared," explains John Vanderwerf, senior systems analyst in the technical services and development department at Technology and Information Educational Services in St. Paul, Minn.

Vanderwerf, whose company beta tested Ryan-McFarland Corp.'s RM Cobol 85 compiler for two months in 1986 and has been a beta site for previous mainframe software products,

says he has been fortunate in suffering few major problems.

"We've been in the middle of major software development in the past, developing our own [school program scheduling] applications with the same software we were beta testing," he explains. "It's a risky business, but, for us, the benefits outweigh the risks."

For Vanderwerf, those benefits are obvious. "In the case of RM Cobol 85, it means getting lead time on the rest of the market on a product that should become a standard for micro Cobol compilers. Working with a standard means we shouldn't have to reconvert our applications again in the future."

Ideally, beta testing should benefit both vendors and users. "There is a gray area with beta problems because the hardware and software configurations a tester uses in-house often don't parallel those used by the vendor," explains Alan Carl, president of Automation Consultants of Menlo Park, Calif., a beta test site for Pick Systems software. "In the end, it's instructive for both sides."

Brian Lloyd, president of Renaissance Designs, a software developer in Germantown, Md., advises potential beta testers not to underestimate their influence on vendors.

"Having experienced it from both sides, as vendor and user," Lloyd says, "I can tell you that finding good beta test users is like finding gold. Vendors cultivate beta sites because they can benefit [the vendors] immensely in the way of real-world testing of their products, improved product documentation and improved rapport with top clients."

"Conversely, users can get

IMPLEMENTATION TACTICS

the jump on their competition, free copies of the final product and, hopefully, better support during and after the beta tests. Beta users have to remember they are doing vendors a favor by testing their products," Lloyd explains.

Roger Sparks, vice-president of marketing at Thoroughbred Software, a Somerville, N.J.-based firm that has just finished coordinating beta tests for its relational data base management system, says that beta testing its products through selected value-added resellers and end users is a major part of its product strategy.

"We value the input of beta test sites," Sparks says. "They simply can cover some of the angles we can miss in testing."

Setbacks

Though the problems experienced with beta testing microcomputer products are usually of a lesser degree than those with larger mainframe software and hardware products, these products can still cause setbacks.

"We always had problems when beta testing," explains Randy Wiseman, coordinator of PC product support at Chevron Information Technology Co., located in San Ramon, Calif. "At the end of one beta test with [Lifetree Software, Inc.'s] Volkswriter, the company pulled a switch on us and changed the user interface. What it amounted to was the product we were working on was not the one that was eventually released. It wasn't disastrous, but it sure upset us. We had put in a lot of work with that original design."

Another beta user, Ed Fisher, senior systems analyst at United Airlines Travel Systems in Austin, Texas, says he has been beta testing various micro software offerings for about two years as part of a major project to provide accounting systems for travel agents. Every so often, Fisher says, his company will experience bugs in the programs bad enough to cause major problems.

"It'll set us back, but we're in a competitive field. The advantages of getting first crack at leading-edge, prerelease software are still way ahead of the min-

uses," he claims.

Beta testers that were contacted by *Computerworld Focus* were in agreement that only certain companies should consent to becoming beta sites. The first prerequisite, they say, should be having the necessary equipment and people to conduct testing adequately.

"It's a given that first-time beta testers will underestimate the time and human resources required for testing," explains Bill Coberly, director of the Center for Microcomputer Applications at the Uni-

versity of Tulsa in Oklahoma. The center is conducting a beta test for an IBM Personal Computer XT clone from Tulsa-based Telex Computer Products, Inc.

"You can't do it part time, and you have to have a good deal of in-house expertise. Another requirement is to have a set of testing parameters in place before the product is brought in. Otherwise, you'll waste valuable time," he says.

Coberly advises, however, not to worry about making the testing that strenuous. "The vendor will have its own set of beta tests that it wants users to handle. In most cases, if a particular user doesn't want to follow a vendor's list, the vendor will field those other tests to other users."

One beta test user at a large Midwest chemical company says that his company tested a Volkswriter package for six weeks with its own test requirements for functionality, features and ease of use. The test parameters were not specifically those the vendor requested.

Beta testers agree that users must have more than just average program-

ming or computer operating skills. Users have to know how the systems work.

"This isn't for the average user who thinks that something is going to run right out of the box," Renaissance Designs' Lloyd explains. "Beta testing is more for the guy who likes to work and experiment and knows the ins and outs of a system."

Along with those qualifications comes the right temperament. Patience seems to be a virtue in beta testing. "You definitely need a certain emotional outlook for

"

'Beta testing is more for the guy who likes to work and experiment and knows the ins and outs of a system.'

— Brian Lloyd
Renaissance Designs

this," Coberly says. "If you're easily frustrated, don't try [it]." Lloyd adds that the beta user should be the type who derives some intrinsic satisfaction from experimenting with something new. "You have to like tinkering."

Not all those who have the ability to beta test are eager to do so, however. Dennis Lockard, manager of end-user support services at Corning Glass Works in Corning, N.Y., says beta testing takes up too many resources while the potential returns are not that great.

"We have an unwritten rule in our data center that says we don't implement anything until six months after its release date," Lockard explains. "We try a balanced approach. We want to be current, and we don't want to become obsolete, but we also want to avoid early beta problems."

Alan Gross, executive board member of the New York-based Microcomputer Managers Association, Inc., says beta testing is too time-consuming a process. "I don't have the time. We're not on the leading edge of technology here. We just did a beta test of a printer/plotter and knocked it around for a week. It's exhausting," Gross explains.

Doesn't want the hassles

Neil Donat of Farmtec, Inc., a San Leandro, Calif.-based provider of pest control equipment, says he would never consider becoming a beta test site user, citing a lack of good in-house programming experience and the abundant availability of qualified outside consultants to produce applications and test software packages for the firm. "I just don't want to go through the [beta] hassles," Donat says.

Do vendors use beta input to change their products before commercial release? Apparently so. Ashton-Tate recently delayed introducing its Rapidfile software due to problems experienced with the package at many beta sites. Lockard says Compaq Computer Corp. took results from Corning and nearly 75 other beta sites into the vendor's laboratories to strengthen the Compaq Deskpro 386's IBM Personal Computer compatibility features.

Another beta user in the Midwest says that Lifetree incorporated the changes she and her colleagues suggested into its Volkswriter software.

One thing beta testers caution against, however, is tying the beta test product too closely with the day-to-day opera-

tions of the company or department. "Throwing a beta test product right into a production environment is a whole different problem," Automation Consultants' Carl explains. "It could affect your entire operation."

Carl and Lloyd suggest that the real crunching of a beta product should be left in the hands of the vendor and third-party software developers, not end users. "A lot of software developers tend to be at the leading edge of the hardware side," Carl explains. "We will push the hardware and software to the limits and beyond to squeeze out that extra bit of performance. That's what we aim at."

Lloyd says that he will try to break beta software just to see how far it can be pushed. "End users don't have the same kind of facilities to do that. And they shouldn't have to."

Even though there are a number of drawbacks to beta testing, users are quick to point out the positive elements they receive during and after the beta testing.

'Individual rewards'

"I think each beta user gets individual rewards from testing," Vanderwerf says. "In our case, beta testing has given us a better understanding of the product, and at the same time, a better understanding of our own needs and abilities. It's also helped us develop closer relations with vendors."

Fisher points out that during the years beta testing has helped his group focus its long-range product planning. "If I can see a product six months before it's commercially released, then I can see how our own future product development falls together," he claims.

According to the Microcomputer Managers Association's Gross, "Beta testing in the micro area usually isn't like [beta testing] IBM products. IBM gives out four or five prototypes of one product, and you're not sure the one you're testing will be the one it actually releases. With most micro vendors, however, what you see is what you'll get. The only caveat with any testing is that you have to be interested in the product. Don't do it as an intellectual exercise."

Another beta tester says the experience has given his organization longer lead times, which offset user training later on and cut down on escalating training costs.

Corning's Lockard explains that micro software vendors carry on beta testing in a less formal manner than mainframe vendors. "A lot [more PC] vendors distribute prerelease hardware and software versions than in the mainframe area. The mainframe beta field requires a great deal more work to implement. Micro vendors such as SAS Institute, Inc., however, will make available and ship beta versions to anyone who wants them," he says.

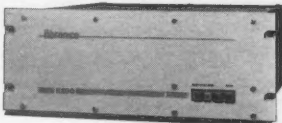
"These are not formal beta sites, and you might not get the same kind of quick beta bug fixes from vendors, but it opens up the beta field to many users who might not otherwise be able to participate," Lockard explains.

Above all, though, beta users stress that users be prepared for the unexpected. "You better expect problems and be prepared to deal with them. If you go into [beta tests] blindly," Vanderwerf warns, "you might get a big unpleasant surprise."

Kolodziej is Computerworld Focus senior editor.

Link IBM Mainframes (VM or MVS) directly to Ethernet

Complete system solution. Fibronics' K200 Ethernet control unit and KNET Software Package handle all communications from your IBM mainframe to the Ethernet. ☐ **Easy to install.** The system connects directly to the IBM Block Multiplexer channel and to the Ethernet using standard cables. Set-up time is less than an hour! ☐ **It's Fast!** System data throughput is 2.5Mbps. File transfer rates are up to 100Kbps. ☐ **TCP/IP standards tie your PCs, work stations or ASCII terminals into a common network.** ☐ **Uses SNA** to communicate with any other IBM host on the network. ☐ **Easy to maintain.** The Fibronics K200/KNET System has extensive built-in diagnostics, and can be taken off-line without disrupting mainframe operations.



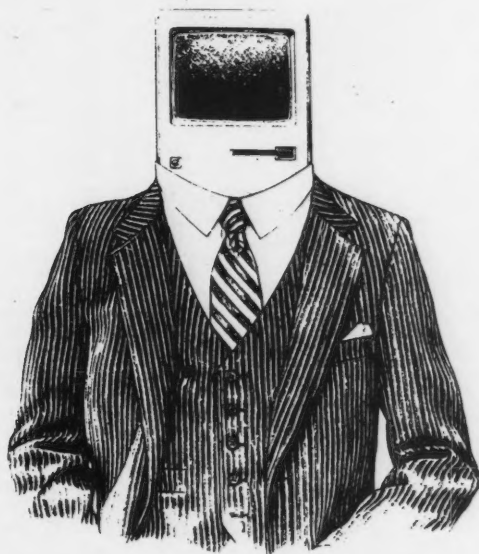
WANT MORE INFORMATION? Write or call Fibronics today!

Fibronics International Inc. **CALL 1-800-DOUBLER**

fibronics communications
Communications Way, Independence Park, Hyannis, MA 02601-1892 Tel. (617) 778-0700 Telex 951297

IBM is a registered trademark of the International Business Machines Corp.
Ethernet is a trademark of Xerox Corp. K200 and KNET are trademarks of Spartacus Inc., a Fibronics Company.

PRODUCT WATCH



The Mac Attack

BY • STAN • KOLODZIEJ

Two years ago, Apple Computer, Inc. was all but written off as a serious contender to IBM in the coveted Fortune 500 microcomputing arena. At the same time, the Cupertino, Calif.-based company was suffering disruptions within its top management that were casting doubts on the company's ability to survive.

Priority 1, repairing torn executive seams, has apparently been accomplished with the final consolidation of power by Apple President John Sculley following the departure of cofounder Steven Jobs.

Priority 2, perhaps requiring more dexterity, has been the task of lifting the Apple Macintosh — and the company's image with it — out of IBM's Personal Computer shadow and into the front ranks of large business microcomputing. It appears Apple is doing just that, having entered the micro heavy-weight division swinging.

It is the quickness of Apple's market thrust that has caught the attention of the press and Wall Street investors. Even the most Apple-enamored industry watchers are struck by the suddenness of Apple's gains.

"I think its success has surprised a lot of people," says Marty Gruhn, vice-president of Tempe, Ariz.-based Sierra Group.

Larry Magid, senior analyst at the Seybold Group in San Jose, Calif., estimates there are one million Macintoshes currently installed in U.S. businesses. Research firm Future Computing, Inc. of Dallas is predicting 270,000 Mac units will be shipped in 1987. (This latter figure does not include possible shipments of Apple's Open Macintoshes, two 32-bit Macintosh upgrades that are slated to debut early this year.)

These figures indicate that Apple is not going to dislodge

IBM's stranglehold on business microcomputing soon but that Apple's profit line is on a steep rise while IBM's is sliding.

Apple's success is all the more surprising because it runs counter to a U.S. corporate attitude grown chary of micro purchases, inclined to capital cutbacks and aimed at remaining with the micro status quo. On the other hand, it might be the same attitude that is pushing the Mac's success.

"Apple's success has to do with the whole micro phenomenon, which is winding down," Gruhn says. "The micro market is no longer hardware driven. The industry and users are now looking for solutions. People want to squeeze more out of what they have. In 1987, the industry will shift to proprietary PCs, and users will be looking for value added by vendors. Apple will do well in that market."

Value added in the case of the

PRODUCT WATCH

Macintosh means an easy user interface and some legendary graphics gymnastics that are now making an impact beyond the niche, generally nontechnical pockets of business computing in which the Mac has engendered a loyal following.

Attitudes change

Ironically, it was this same ease of use and emphasis on good graphics that originally helped isolate the Macintosh from the more austere business atmosphere dominated by IBM. Attitudes change. The escalating cost of computer training makes ease of use more attractive, and the push toward quality graphics output and desktop publishing as a way of maximizing micro use have put a productivity spotlight on the Macintosh.

There is an argument that the market has finally caught up to the Macintosh, providing a more receptive stage for the Macintosh to show cost-saving features. In another sense, however, Apple and the Mac are finally catching up to the rest of the computer market.

During the years, the Macintosh languished as a stand-alone, proprietary device while the rest of the world looked to connectivity with other systems, primarily IBM's, through local-area networks (LAN) and other communications links. The Macintosh also suffered from a lack of third-party software vendor support that it needed to produce anywhere near the number of programs that were being developed for the Microsoft Corp. MS-DOS-based PC.

However, the surge in Macintosh sales has lured a growing cadre of these third-party software and hardware add-on vendors that are finding the Mac a lucrative and alternate avenue of revenue away from the intensely competitive and nearly saturated IBM PC market. Such activity is providing more ammunition for Apple to sway the attention of corporate micro buyers away from IBM.

"In the business spreadsheet area, Microsoft's Excel [for the Macintosh] has been hot, the company's Appletalk local-area network is selling well, communication with IBM mainframes through packages like Tops [from Centram Systems West, Inc.] and Macmainframe [from Avatar Technologies, Inc.] is there, and the Small Computer Systems Interface [SCSI] standard is letting the peripheral makers plug into the Mac," Seybold's Magid explains. "They are getting more of the corporate pieces together."

If anything, Apple has been consistent in its strategy under Sculley. Some of these strategies, like any investments, have paid off; some haven't. One big plus paying dividends has been Apple's insistence that software developers writing for the Mac adhere to Apple's strict set of data formatting and command guidelines. This mandate has resulted in a tight interoperability of third-party software, which enables users to exchange files across a spectrum of Macintosh applications.

Software compatibility seems to represent a significant plus for Macintosh users contacted by *Computerworld Focus*.

"A standard interface between many software applications was one of the good things about the Macintosh," says Pat Natale, vice-president of auditing at the Prudential Insurance Company of America in Roseland, N.J. "It's minimized our training costs."

Bill Storms, manager of micro re-

sources at Washington state's Department of Transportation, located in Olympia, points out the "seamless interface between Apple software applications. The issue is transparent compatibility. It makes it easier to use with less training. You can be up and running quickly with little overhead."

However, Apple's strategy of closing the Mac's architecture to other hardware vendors may be backfiring. It is virtually impossible for vendors and users to extend and customize the Macintosh. And there is no such thing as a Mac compatible nor will there be soon.

"I don't think it's such a major concern now [with users]," Storms explains. "But the fact is somewhere down the line, if it comes down to price, a lot of MIS departments could opt to go the route of mixing some IBM PCs, some compatibles and maybe some clones and remain in the MS-DOS world simply because there are no Mac compatibles or clones to cut costs."

Apple moved in the direction of a more open architecture in January 1986 with the introduction of the Macintosh Plus, which provides a high-speed socket for

while it also provides 3270 terminal emulation. Macwinds 3270 from Tri-Data Corp. of Mountain View, Calif., allows a user to conduct up to four concurrent IBM Binary Synchronous Communications and Systems Network Architecture sessions, each within a separate Macintosh screen. Other communications vendors are following suit.

Plans for Appletalk

Apple is also putting in place plans for its Appletalk LAN, especially with its recently introduced Appleshare, a software-only product that converts any Macintosh equipped with a hard disk into a LAN file server. Apple also released the Appletalk PC card that, with software not yet available, will enable IBM PCs to become nodes on Appletalk networks.

To Apple's definite advantage there is also some third-party activity within Appletalk. One company drawing some attention is Centram Systems West, a Berkeley, Calif., company whose Tops for Unix is a software product that offers direct file sharing among Macintoshes, IBM PCs and Unix-based machines over Centram's Tops LAN.

99

Of the various pieces making up the Macintosh's corporate success, desktop publishing is the biggest.

limited hardware expansion. However, the real nod to Macintosh expansion is expected with one of two Open Macintoshes, a machine sporting a Motorola Corp. 68020 32-bit processor and numerous expansion slots.

Products for the Macintosh Plus

In the meantime, some innovative companies are taking advantage of the minimal expansion capabilities of the Macintosh Plus. General Computer Co. of Cambridge, Mass., which was the first to introduce a 20M-byte hard disk drive for the Macintosh, now has a 40M-byte hard-disk offering of its Hyperdrive; Bering Industries, Inc. of Scottsdale, Calif., has introduced a line of removable hard disk drives for the Macintosh; and Radius, Inc., a Sunnyvale, Calif., newcomer, has provided Mac users with a 15-in. screen.

Slow to announce its own in-house communications products, Apple has seen the void filled by third-party vendors that are coming out with an array of Mac-to-IBM mainframe links. It's a good thing. Macterminal, Apple's IBM 3270 terminal emulation facility, is hampered considerably by its inability to transfer data back and forth to the mainframe, while some industry watchers point to indications within Apple that Macterminal enhancements have been harder to put in place than originally expected. (In January, however, Apple did introduce some products that convert data from IBM mainframes and from IBM PCs and compatible word processing programs into a format that Apple's Macwrite word processing software can use.)

Into the breach have come vendors like Avatar Technologies, Inc., a Hopkington, Mass., firm whose Macmainframe package enables IBM mainframes to transfer Macintosh image and data files between IBM hosts and the Macintosh,

Even Du Pont Co.'s Connector Systems Division in Cumberland, Pa., is scheduled to introduce a connector that will enable Macintoshes on an Appletalk network to use fiber-optic cabling for transmitting data.

Appletalk is a dark horse among LANs. Although the product received relatively little publicity, Dataquest, Inc. of San Jose estimates that there are nearly 200,000 Macintoshes used as nodes in LANs, the majority of which are small Appletalk networks of four to five machines. The days of the Macintosh as a stand-alone whiz seem numbered.

If the Mac-to-IBM mainframe strategy is clear, the one strategy tying the future of the Macintosh with MS-DOS is finally coming into focus. Apple is rumored to be including a coprocessor in its imminent Open Mac announcement to run MS-DOS application software. Another company, Complete Management Systems, Inc. of Costa Mesa, Calif., is getting attention with a hard-disk subsystem called Data Exchange, which enables IBM PCs to share files with Macintoshes through an SCSI bus.

Software vendors that have made a name in the IBM PC field are now turning to the Macintosh. Borland International, Inc. located in Scotts Valley, Calif., will be introducing Reflex, a data base management system for the Mac; Ashton-Tate of Torrance, Calif., is slated to introduce a Mac version of its Dbase package; and Microsoft already has a Macintosh version of its Microsoft Word word processing package.

Just how important it will be to Mac users to run MS-DOS applications might be a moot point, however.

"Software compatibility with MS-DOS would be nice," Natale explains, "but I don't think users would really need it. There are so many good programs written specifically for the Macintosh now,

These are two separate systems with separate worlds of users and applications."

Of the various pieces making up the Macintosh's corporate success, desktop publishing is the biggest. By a fortunate mix of the right machine at the right time, Apple has ridden the crest of the desktop publishing phenomenon now sweeping the U.S. In effect, the Macintosh has become the de facto standard in desktop publishing.

The price is right. A working configuration of Macintosh, Apple Laserwriter and desktop publishing software can be purchased for about \$15,000 with capabilities beyond the low-end, PC-based systems and with a price tag well below the specialized micro-based publishing systems now on the market.

A landslide of desktop publishing software products for the Macintosh has appeared in the past year, most notably Pagemaker from Seattle-based Aldus Corp. and Illustrator from San Francisco-based Adobe Systems, Inc., which go beyond Apple's own MacDraw in capability.

Mike Bailey, program plans specialist at the Missiles and Space Division of Lockheed Corp., says the Mac publishing software obviates the need for programmers to get involved at stages of report writing, as was the case with mainframe-generated company reports.

Thom Holmes, director of office automation publications at Delran, N.J.-based Datapro Research Corp., says the firm looked at both the Macintosh and IBM PC publishing software before opting for the Macintosh. "The first wave of desktop publishing software for the Mac was really one dimensional, but that changed quickly," Holmes says. "Though PC [publishing] software is getting away from the command-driven mode and interfaces, it still has a way to go."

That gap could be closing, however. IBM has promised greater graphics capability and better user interfaces with upcoming PC product announcements, and a number of software vendors such as Aldus are entering the market with PC versions of their Macintosh publishing packages. Also, the new Intel Corp. 80386-based micros coming out have the power and promise to offer more in the way of graphics and publishing.

Overcoming stereotypes

All of this could take away some of the Mac's thunder in desktop publishing, but that is beside the point. Analysts agree that Apple is going to have to do more than use its desktop publishing hold as a means of multiplying its corporate installations. The Mac might now be facing its biggest barrier: the perception that the Macintosh is still, in the end, a special-purpose micro meeting the needs of only certain business users.

"We had some persuasive users who had Macintoshes at their homes," Storms explains. "They convinced us to look at them. I don't think we [in MIS] would have otherwise."

Gruhn at the Sierra Group says Apple has played the niche game and played it well. "But now everybody is playing the same game," she explains. "One thing is clear: Apple has taken on a more serious business demeanor. But I still don't know if the business community can forget Apple's image," Gruhn says. "Cute and corporate don't go together." E

Kolodziej is Computerworld Focus senior editor.

SPECIAL SECTION

Desktop Publishing

BY • R E B E C C A • H U R S T



ELECTRONIC PUBLISHING IS THE PRODIGY OF the computer industry. Offering the ability to produce near-typeset-quality publications quickly and cheaply, it has captured the imaginations of thousands of users.

The wave of user interest received its impetus at the desktop level from the terrific trio: Apple Computer, Inc.'s Macintosh computer and Laserwriter printer and Aldus Corp.'s Pagemaker publishing software. For about \$10,000, these products provide users with a fairly powerful desktop publishing system.

Interest has also extended to higher end publishing

products that cost several times more, particularly among corporations with large-scale in-house publishing demands. Whether an organization has a large or small system, however, most users give computer-aided publishing systems rave reviews.

"Using our Interleaf, Inc. publishing system is 60% faster than using our Honeywell, Inc. computer," says Gail Greenwood, a production artist in the publishing group at McDonnell Douglas Communications Industry Systems Co. in Denver. With the Honeywell system, users had to use a separate program to format their documents, she explains. "If you had to edit it, you then had to rerun

SPECIAL SECTION

it through the format program and print the document." With the Interleaf system, a user can edit the formatted document and see how it looks before it is printed, Greenwood notes.

"In the last 20 years, I've had only two clients who could not make substantial improvements in the way they were publishing," says Jonathan Seybold, president of corporate consulting firm Seybold Publications in Malibu, Calif. In both these situations, the technology was not yet available, he explains.

Despite their capabilities, however, publishing systems are just tools, warns Suzanne Watzman, president of Watzman + Keyes, a Cambridge, Mass.-based consulting firm that specializes in developing in-house electronic publishing systems.

To provide a true solution, managers must identify their needs, establish a corporate plan, design standards and train people to use the system in addition to buying the equipment, Watzman advises. "You can't just plunk down \$50,000; technology fixes won't do anything." Working out the changes these

systems bring takes time, she asserts. Consequently, Watzman notes, "It's not the cost of equipment that does you in; it's the cost of training."

Moreover, managers considering electronic publishing, even a desktop system, should realize that this may alter not only the way materials are printed but also the job structure of the staff producing them, consultants agree. Some jobs may be created, while others are eliminated or redefined.

Updating the process

Electronic publishing does nothing less than change the process by which documents are produced and authorized. Using the old method, a manager would request a brochure, for example. A writer would come up with the copy and hand it to a designer for a mock-up. The

writer and designer would then bring the mock-up to the manager for approval. If there were any changes, the whole process would be repeated.

Using an electronic publishing system, the new process is more of a team approach, Watzman asserts. The manager, writer and information designer meet to review the product and goals. Next, the writer works with the page designer on the system. The manager can then view it on the screen and make changes. Not only does this save paper and time, it also means that once the text is done, it's done, Watzman notes.

This process is likely to displace some production jobs, and employees in these areas may end up with positions that are more manual than creative. Writers and artists who were responsible for an organization's documentation and design, re-

spectively, now may be required to know more about each other's roles, says Elizabeth Keyes, executive vice-president of Watzman + Keyes.

Electronic publishing has also created some positions, including information designer, visual editor, keeper of standards and internal consultant.

As the developer of a corporation's design standards, the information designer establishes a working base for employees in the other positions. The information designer is responsible for meshing design and content with corporate identity, according to Keyes. Therefore, the job requires an extensive combination of design, content (writing), graphics, management, engineering and human relations skills. This is a temporary, consulting position.

Once the information designer sets

Lights! Camera! Desktop Video!

WHAT'S THE NEXT step beyond desktop publishing? It is desktop video production, of course.

An entire class of video production machines, mostly based on the IBM Personal Computer AT, has sprung up to service the amateur and professional producer alike. At a cost of only a few thousands dollars (as opposed to hundreds of thousands of dollars for high-end systems), such devices allow the user to edit videotape, perform sound mixing, generate low-end computer graphics like logos and titles, experiment with special effects and turn out quality videos.

We may not be talking George Lucas-class films here, but this can be top-grade stuff. The PC systems are good enough that some TV stations in California use them instead of more expensive facilities. And, according to Gregory Solman, teleproductions editor of New York-based *Millimeter* magazine, a trade publication for television and film professionals, "PC-based systems are being used increasingly for everything from machine control to the production and postproduction environments."

For instance, San Francisco-based Cubicomp Corp. sells a complete turnkey system called Picturemaker for \$36,500 and up. The system is an AT-based product that can claim NBC San Francisco affiliate, KROM TV, as a user.

Or, if you just want a board-level product that will fit into an IBM PC or compatible that you already own, U.S. Video of Maitland, Fla., will sell you its Overlay 400 board for \$1,200. "We've had several customers use the system to produce animated, business presentation graphics," notes David L. Medin, U.S. Video general manager.

So, have your agent look into it. It might be worth a screen test.

— Michael Tucker

MAKE YOUR PC FOCUS RAMIS.

SPECIAL SECTION

corporate publishing standards, a company may hire a full-time visual editor to uphold these standards. The visual editor acts as a liaison between the writers and production artists, Keyes says. The job requires someone who understands both editorial and visual concepts.

A related position is that of the keeper of standards. This person ensures that the image a company presents is consistent, Keyes says. Unlike the visual editor, this person views the design standards from a top-level perspective.

In large corporations, the internal consultant assists and trains employees at other locations in how to apply the standards set by the information designer, Keyes says. "They're critical in making the whole thing work." This consulting position may be held by one or more people in the central publishing

department who understand standards, the company's product and writing.

Also, in setting up the publishing system, companies will probably need a technically oriented employee or consultant to implement the typesetting and design codes in the publishing system.

An audit of company needs

Given the potential for far-reaching impact within a company, managers considering an electronic publishing system need to do an objective audit of the company's needs, Watzman and Keyes recommend. "They need to ask what their available resources are, what they want the system to do and what the system can't do yet," Watzman says.

Managers should also look at the different materials they are producing, Keyes says. "Look at the end-user needs

and the corporate position," she suggests. "You may have been using 10 formats, but you probably only need two or three." A team that includes representatives from customer support and field sales as well as people from product development, publishing and corporate management should ask these types of questions. "The people who work with the end user know how well the materials are working," Keyes states.

Remaining objective during this internal audit can be tricky. Staff members must maintain their regular deadlines and do not have extra time for a full audit, Keyes says.

While self-auditing can be difficult, there are five steps users can take in choosing and implementing an electronic publishing system, Seybold suggests.

See **PUBLISHING** page 27

Scanners See Market Rise

THE FUTURE LOOKS BRIGHT for another side of desktop publishing — scanners.

Scanners are devices that take text and/or images on paper and convert them to electronic media. Depending on one's definition, scanners will range from machines that are similar to desktop copiers to optical character recognition (OCR) units.

Combinations of desktop copiers and OCRs are also showing up in the market, but for now they can be regarded as separate technologies.

A complex and still-experimental technology, OCR attempts to read text — that is, to recognize individual letters — and translate the text to ASCII code in which it can be managed by word processors.

OCR units are particularly useful in operations in which large masses of data from disparate printed matter must be converted to some standard electronic form for further manipulation. As such, these machines are already becoming important to large-scale publishing operations. They may become even more important to the chief information officer, whose job it is to manage diverse data to gain a strategic advantage.

However, OCRs may be less useful to desktop publishing, an area that is not as much interested in the strategic manipulation of data as in its what-you-see-is-what-you-get presentation. For the average desktop publisher, an image scanner, which simply takes the image of a document and converts it to a bit-map display, may be the better tool. With a scanner, pictures or text can be taken from almost any source and faithfully reproduced by laser, ion deposition or even impact printer.

The importance of scanners to desktop publishing may best be seen in the recent alliance of Aldus Corp., Hewlett-Packard Co. and Microsoft Corp. Under the terms of a pact announced in last October, the three firms will cooperate in the production of a desktop publishing kit with Aldus supplying its Pagemaker desktop publishing software, HP providing computing and printing hardware and Microsoft contributing its Windows operating environment and word processing software.

This month, HP will also announce Scanjet, an IBM Personal Computer-compatible desktop scanner. Scanjet is bound to strengthen the already forbidding Aldus/HP/Microsoft front. Equally important is that the product is one of a new generation of scanners that are so inexpensive and user-friendly that even the desks of quite small desktop publishers can support them.

Indeed, Scanjet's introduction raises the interesting question of whether scanners of some sort will not eventually be a standard component of everyday word processing, the way that printers are already.

— Michael Tucker

Ease-of-use, cooperative PC-mainframe computing, powerful information management, and customized reporting are necessary to make your workstation more productive. Only RAMIS® PC Workstation delivers them all.

Flexible, Easy Information Access.

RAMIS PC Workstation gives you the freedom to organize all your PC software and applications to suit your daily computing routines. The Workstation Manager's pop-up windows let you move between programs and applications with a single keystroke. And, if what you need is stored on the mainframe, Workstation Manager's automatic login provides a seamless connection.

Direct Link to RAMIS Information System.

When you need information from mainframe RAMIS or from any data base accessible to RAMIS, RAMLink delivers it to your PC, error-free and automatically converted to the format you desire. With RAMLink, you have the power to exchange information between your PC data base, spreadsheet, or word processor and mainframe files. RAMLink's pop-up menus form a seamless connection with the mainframe, so you feel like you never left your PC.

Powerful Data Base Management.

Just because you need a sophisticated data base manager doesn't mean you have to compromise ease-of-use. You can have both with RAMIS/PC Workstations's KeepIT. KeepIT's pop-up windows make data entry, maintenance, and reporting quick and easy. A built-in screen painting editor gives you complete freedom to design data views and files. KeepIT's powerful relational capabilities let

you link multiple files to handle the most complex applications. KeepIT is the perfect PC companion to RAMIS Information system, giving you the power to create mainframe RAMIS file and screen descriptions from your KeepIT files. With RAMIS PC Workstation you get mainframe power with PC comfort.

THE NEW RAMIS/PC WORKSTATION

- ✓ Advanced window technology
- ✓ Direct mainframe RAMIS connectivity
- ✓ Relational data base management
- ✓ Customized reporting
- ✓ Cooperative mainframe companion
- ✓ Expert support

Customized Reporting.

RAMIS/PC Workstation gives you a reporter that makes it easy to create the most sophisticated reports. Because PC/Reporter is a 4GL-based program, you have the power to prototype reports on your workstation using information stored in a mainframe RAMIS file or any data base accessible to RAMIS. Pop-up menus prompt you through every step, or you can use mainframe RAMIS syntax when you're ready. PC/Reporter provides the flexibility you need to create reports using data from a variety of PC software, including dBASE III™ and Lotus® 1-2-3™. With PC/Reporter, you create the reports you've always wanted, no matter where your data is stored.

An Effective Information Center.

When you need a cooperative mainframe companion for your PC workstation, RAMIS Information System is the solution. The advanced menu-based architecture provides an easy PC-like approach to accessing data, prototyping applications, and producing sophisticated reports. Unlike competitive products, RAMIS processes applications with a compiled fourth generation language, giving you faster response and more reliable applications. RAMIS Information System gives you concurrent, multi-user updating when other 4GLs rely on single-threaded mechanisms, making you wait. And with RAMIS Information System, you receive expert support that comes from seventeen years of experience and knowledge in the software industry.

Call Now.

Let RAMIS/PC Workstation change your PC focus. To make your workstation more productive, call toll-free or write for more information. On-Line Software International, Inc., Two Executive Drive, Fort Lee, NJ 07024. In Canada, call 201-592-0009.

800-642-0177



On-Line Software International
Authorities in IBM Software

RAMIS/PC Workstation

PC Tools for Data Base Management, Reporting and Mainframe Connectivity.

IBM is a registered trademark of International Business Machines.

CIRCLE READER SERVICE NUMBER 268

SPECIAL SECTION

**Jose Ramos,
Publisher of
"WYSIWYG"**¹

	Ease of use	Sophistication of graphics capabilities	Sophistication of text functions	Ability to import and export documents	Overall performance, power and reliability
Apple Computer, Inc. Macintosh Packages					
Aldus Corp. Pagemaker 1.2	3	2	2	2	3
Letraset ² Ready-Set-Go 3.0	3	3	3	2	3
P.S. Publishing, Inc. P.S. Compose	3	0	3	2	2
Microsoft Corp. MS-DOS Packages					
Aldus Corp. Pagemaker 1.0	3	2	3	2	3
Studio Software Corp. Front Page 1.1	2	2	2	1	2

**Keith Thompson,
President of
Lexington
Research, Inc.**²

	Ease of use	Sophistication of graphics capabilities	Sophistication of text functions	Ability to import and export documents	Overall performance, power and reliability
Apple Computer, Inc. Macintosh Packages					
Aldus Corp. Pagemaker 1.2	4	3	2½	2½	3
Letraset ² Ready-Set-Go 3.0	2½	1	3	3	2½
Boston Software Publishers Macpublisher II 2.69	1	2½	2	2	2½
Microsoft Corp. MS-DOS Packages					
Software Publishing Corp. Clickart Personal Publisher	3	2½	2	2½	3
Xerox Corp. Xerox Ventura Publisher 1.0	2½	3	3	4	3½

¹ "WYSIWYG" is a newsletter for computer-aided publishing.
² Developed by Manhattan Graphics Corp.

¹ Lexington Research provides application evaluations.
² Developed by Manhattan Graphics Corp.

TAKING A CUE FROM such venerable movie critic teams as Chicago-based Gene Siskel and Roger Ebert, *Computerworld Focus* asked two desktop publishing software experts to rate some of the better known packages on the market today.

Jose Ramos is an industry consultant and the publisher of "WYSIWYG," an electronic publishing newsletter located in Redwood City, Calif. Keith Thompson is the president of Lexington Research, Inc. in Lexington, Mass., where he evaluates applications, including several publishing packages.

Ramos and Thompson each rated five publishing applications on a scale of 1 to 4 (see chart above). The following are specific comments by both men about the packages they rated.

JR: "Pagemaker 1.2 is the best first-generation desktop publishing package. It provides

page layout, but it doesn't incorporate word processing."

KT: "Pagemaker 1.2 is the easiest to learn, but it does not export anything to other packages."

JR: "Ready-Set-Go is shaping up to be the best second-generation publishing package, and it's the best package for the Mac. It provides word processing as well as hyphenation and justification. Ready-Set-Go is beginning to move toward third-generation software, which will have greatly improved graphics."

KT: "Ready-Set-Go is the fastest thing on the Macintosh. It's not as reliable as it could be or hopefully will be, though. Also, users can't copy a graphics element and use it elsewhere; they have to recreate it. This should be relatively easy to correct."

JR: "PS Compose is not in the

same league [as the other two Macintosh packages]. It started off as a code-driven typesetting package that was improved for desktop publishing, but PS Compose doesn't offer the functionality of, say, Ready-Set-Go."

JR: "Pagemaker 1.0 on the PC might be good if users already have Pagemaker running on Macintoshes and want to integrate Macintosh and Personal Computer files. But it's slower on the PC than it is on the Mac, and it's still a first-generation package."

JR: "I like [Frontpage 1.1], but a lot of the icons are confusing because they were designed for graphics artists. These are so ingrained in the program, it would be hard to tear them out."

KT: "The Ventura Publisher 1.0 product has a full range of

graphics tools and very sophisticated kerning. It also can import and export files from popular word processing software packages. Ventura is not for the casual user; someone without layout experience will have problems."

JR: "Ventura is the best publishing package for the IBM PC."

KT: "Macpublisher II is rather confusing and takes a long time to learn. It doesn't follow the conventions of most Macintosh programs."

KT: "Clickart Personal Publisher is a fun program, but its performance should not be compared with the other applications. It's a lightweight package and is not really intended for documents of more than two pages. It performs nicely, though, and has an uncanny resemblance to Macintosh packages."

Desktop Publishing Packages: Feature Comparison

Company/Product	System Runs On	Price	Memory Required	Pages Per File Supported	Hard Disk Required	Full Page View	H&J ¹	Interactive WYSIWYG ²	Automatic Pagination	Text Wraps Around Graphics	Kerning ³	Graphics Cards Supported
Aldus Corp. Pagemaker 1.2	Apple Computer, Inc. Macintosh	\$495	512K bytes	16	no	yes	no	yes	yes	no	yes	N/A ⁴
Aldus Corp. Pagemaker 1.0	IBM Personal Computer XT, AT or compatible	\$695	512K bytes	128	yes	yes	yes	yes	yes	no	yes	Hercules ⁵ EGA ⁶
Boston Software Publishers Macpublisher II 2.69	Macintosh	\$195	512K bytes	100	no	yes	no	yes	yes	no	yes	N/A
Letraset Ready-Set-Go 3.0 ⁷	Macintosh	\$295	512K bytes	limited by memory	no	yes	yes	yes	yes	yes	yes	N/A
P.S. Publishing, Inc. P.S. Compose	Macintosh	\$800	512K bytes	200	no	yes	yes	yes	yes	yes	yes	N/A
Software Publishing Corp. Clickart Personal Publisher	IBM PC or compatible	\$185	512K bytes	99	no	yes	no	yes	no	no	no	Hercules, EGA, CGA ⁸
Studio Software Corp. Frontpage 1.1	IBM PC XT, AT or compatible	\$695	512K bytes	8 per job	yes	yes	yes	yes	no ⁹	yes	yes	Hercules, EGA, CGA
Xerox Corp. Xerox Ventura Publisher 1.0	IBM PC XT, AT or compatible	\$895	640K bytes	120	yes	yes	yes	no	yes	yes	yes	Hercules, EGA, CGA

¹ Hyphenation and justification

² What you see is what you get

³ Kerning is the reduction of space between characters

⁴ Not applicable for Macintosh packages

⁵ Hercules Computer Technology, Inc.

⁶ Enhanced graphics adapter

⁷ Developed by Manhattan Graphics Corp.

⁸ Color graphics adapter

⁹ Provides automatic page numbering but not page jumping

SPECIAL SECTION

PUBLISHING from page 25

Like Watzman and Keyes, he recommends focusing on the publishing process and the people involved.

The first step managers need to make is to take a systems view of the entire publishing process, from creating information to putting it in the recipient's hands, Seybold states.

The nature of the documents will affect the publishing process. Some may be published only once; others more

frequently. The key is to understand the whole process. "The biggest mistake is to automate only part of the process," Seybold warns.

Second, managers need to make a mental model of how they would like the process to work. "To create this model, companies should form a small task force," Seybold recommends. This task force should consist of employees who represent the different constituencies involved in the publishing process. "The leader of the group should have an analytical frame of mind and the ability to take a broad view," Seybold says. "Most people get mired in the details and lose sight of crucial factors."

Don't get sidetracked

For example, one client Seybold assisted had a task force that was focusing

its attention on text composition systems. When Seybold's analysts asked them about their documentation, though, they took great pride in describing their graphics. "Graphics was their greatest cost, but they were looking at a text system."

The third step company managers must take is to analyze the cost per benefit. The real reasons why users want to improve the publishing process include better control, faster turnaround time and improved quality, Seybold claims. However, these reasons are not easily quantifiable in terms of cost.

Instead, he says, managers should look at values that can be quantified, such as the cost of purchasing outside services vs. providing them in house. Most people then use these hard numbers as the basis for the budget they

present to upper management, Seybold says. Some daring employees will assign a value to control or timeliness, he notes, "but if you can cost-justify the system without that, it's a lot less debatable."

Fourth, managers need to identify the combination of publishing procedures and electronic publishing system best suited for the firm's applications. Different software packages are better for different publishing requirements, Seybold notes. "Aldus Pagemaker and Xerox Corp. Ventura Publishing Software are both good programs with specific sets of strengths and weaknesses," he points out. "There are many situations where Pagemaker is better and many others where Ventura is."

For example, the Ventura package works on the IBM PC, can be difficult to

PCs Drive Mag's Composition

ONE STORY THAT SAYS much about the fate of desktop publishing technology is that of Roger Black, art director for *Newsweek* magazine.

Black was recently asked to become a consultant to *Eco*, a general-interest publication based in Mexico City. At his suggestion, *Eco* is using the Ventura desktop publishing system from Xerox Corp. of El Segundo, Calif. "Ventura didn't seem right for *Newsweek*, which is a very big operation with its own dedicated Atex Corp. system," Black says. "But for a new launch, it seemed appropriate."

Black recommended a personal computer-based system due to the unusual economic requirements of the start-up publishing venture. "Eco was interested in PC-based systems for two reasons," he says. "First, it couldn't afford a minicomputer-based system and, second, the pool of journalistic talent in Mexico is small. So, handing out PCs to everyone is interesting. You can increase the productivity of the staff you do have."

And, in turn, Black was interested in *Eco* as a proof of desktop publishing as a technology.



Roger Black

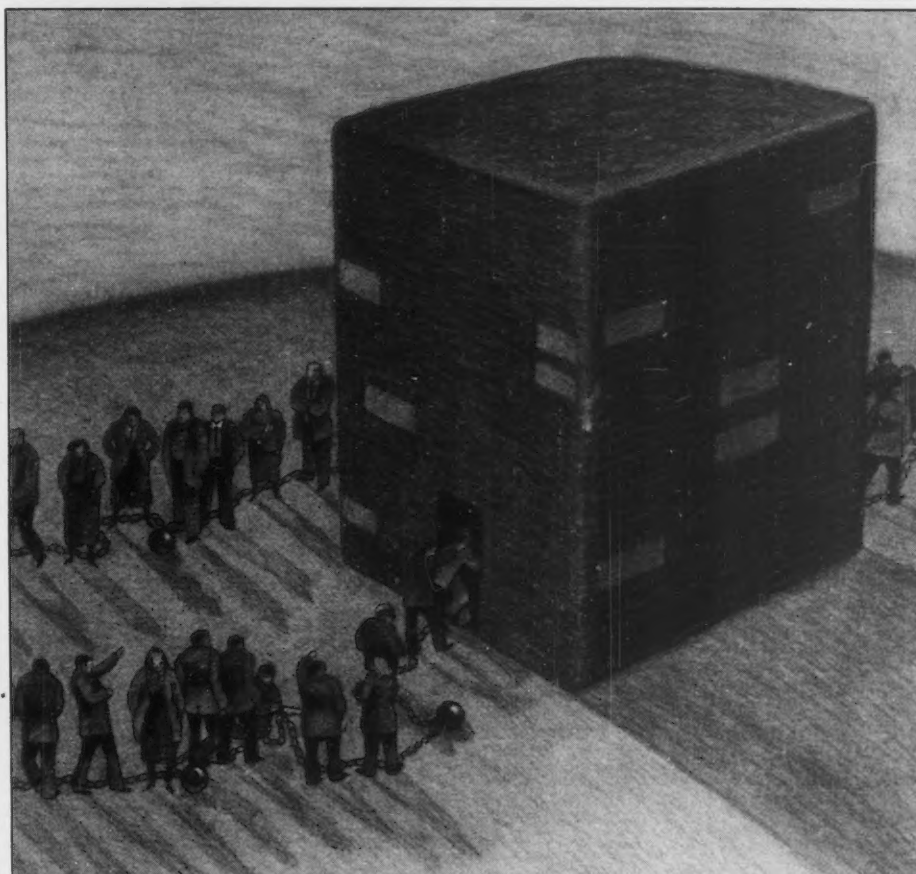
"I knew that if it would work in there, it would work anywhere."

By January, Black had the proof he wanted. *Eco* was set to publish using five Ventura systems and a laser printer/typesetter. To keep cost and complexity down, the machines will not be networked; rather, documents will be transferred by the physical exchange of floppy disks and telecommunications will consist of a modem. It all worked and did so very inexpensively. "The whole setup is probably going to cost less than \$100,000... and for that we're going to be doing typesetting as well as all editorial functions in-house."

Ventura did have its failings. Black notes "the drawbacks we found were in handling pictures. At this point, it looks like we won't be doing extensive photo layout with the Ventura."

However, overall, Black is pleased with Ventura. If he could, he would introduce it to *Newsweek*. "If we could find a PC-based system that did layout as well as Ventura and that could link up with the Atex system, we'd buy it today."

—Michael Tucker



Why settle for a mainframe?

Realia offers you IBM mainframe compatible COBOL, CICS, and the development aids you expect (along with a better debugger than the mainframe has ever seen). On your PC. On your desk. Now you can escape the slow response time, long report queues, high costs and conflicting priorities of overburdened mainframe processing — without hitting the all-too-common micro limits on file size, options, and speed. Settle for the best of both worlds. Call Realia.

REALIA®

10 South Riverside Plaza ■ Chicago IL 60606 ■ (312) 346-0642 ■ Telex 332979

CIRCLE READER SERVICE NUMBER 269

SPECIAL SECTION

PC System Gets High Nielsen Ratings For Production Control

DESKTOP PUBLISHING HAS firmly established itself as a major industry and an important tool for computer users in the corporate world.

A. C. Nielsen Co. of North Brook, Ill., produces documentation for mainframe and IBM Personal Computer software. Traditionally, the firm has used a professional typesetter to turn its documents into printed matter. However, in 1986, Nielsen decided to experiment with Superpage II, a \$7,000 high-end, PC-based system from Bestinfo of Springfield, Pa.

"Last year, we did a 2,700-page manual for some mainframe software," says Nielsen senior writer Mike Ellsworth. "This year, we're bringing out a PC-based version of the software. Before, we [did] the manual with a typesetter company, but this time, we're doing it in-house with Superpage."

Why go with a desktop system when Nielsen could easily afford a professional typesetter? "Control as much as anything," Ellsworth explains. "Our experience with typesetters was probably better than average, but that still wasn't very good." Specifically, Nielsen found its galleys tended to return from the

professional typesetting company swarming with errors. The problem wasn't incompetence, only that communication between Nielsen and the typesetter broke down occasionally.

So, Nielsen took its typesetting operation in-house, where mistakes would occur but not as often. "We also hope to save a little money," Ellsworth notes.

Ellsworth says that there have been some problems with the Bestinfo product. "We have Superpage 2, and when that first came out, it was full of bugs. But, the company came out with a corrected version and that seems far better," he says.

There are also some features Ellsworth would like to have seen in Superpage. "We'd like to have a way to globally delete pages," he says.

On the whole, Ellsworth says he is satisfied with the product. "We're pretty pleased with Superpage. . . . Sometimes I do wonder if it isn't overpriced, now that so many other desktop publishing packages have come out. . . . but it does do what Bestinfo says it does." As for desktop publishing, though, he has no doubts at all. "The control it gives you is enough, even if it doesn't save any money at all."

—Michael Tucker

It's simple. Nastec offers you more!



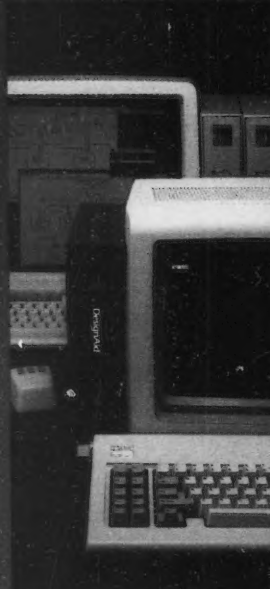
INFORMATION

THE CASE REPORT—a collection of timely articles for software developers about Computer-Aided Software Engineering (CASE). **THE CASE REPORT** brings you industry overviews and technical analyses—not product reviews—written by professionals who are knowledgeable about the CASE evolution and, in many instances, we driving it. Topics include software metrics, real-time systems, AI, object-oriented programming, team systems analysis, and more.



EDUCATION

CASE education programs—to help you understand and apply CASE technology. Understanding the applications makes it easier to implement CASE tools within your organization. Programs include: Structured Analysis and Design, Project Management, Software Engineering, Team Systems Analysis, and many others.



TOOLS

CASE tools—to help you build better software. **DesignAid** automates your chosen structured analysis/design techniques. It supports real-time data process modeling and meets all other documentation challenges. **DesignAid** is built around a central shared data base, networked for a team approach to software engineering. On an IBM PC or on a Digital VAXstation, **DesignAid** can combine with other leading software tools to create an integrated CASE environment.

INFORMATION, EDUCATION AND TOOLS FROM NASTEC

Why Settle For Less?



Nastec Corporation

26401 Northcrossway
Southfield, Michigan 48035
313-353-3300 / 800-872-8256

CIRCLE READER SERVICE NO. 220

learn but has some extended functionality. Pagemaker works on Apple or IBM machines, is easier than Ventura to learn but does not offer the same capabilities that the Xerox software does. (See chart page 26.)

In addition to Seybold's guidelines on purchasing software, electronic publishing users have a few of their own suggestions for choosing software. A key strategy is to talk with people who use a software package that you are interested in, says Nancy Cooper, who handles publishing in the Information Systems Group at Hospital Corporation of America in Nashville. "If a vendor won't give you a list of users to talk to, I'd seriously consider another vendor," she states.

Managers should also bring samples of their documentation to the vendors and watch them produce samples on their systems, McDonnell-Douglas's Greenwood recommends. "Look to see if the vendors can reproduce or improve upon what you've brought in."

While reviewing packages, managers should not lose sight of the people who will be using them, Seybold says. "You must look at the people, process and software programs as a whole."

Getting users involved

Fifth and finally, Seybold recommends that managers need to merge their system selection and implementation procedures. "The people who are responsible for implementing the publishing system should be actively involved in selecting it and using it," Seybold says. Users should feel they are working with a system that they helped choose. This user input is significant because the installation of publishing systems is making fundamental changes in the way businesses operate. Therefore, a lot of the system's success depends on the enthusiasm, willingness and creativity of the people in charge of implementing it.

"If users are part of the decision process, they will find all the ways they can to make it work. If it's imposed on them, they'll find every reason for it not to work," Seybold claims.

The same considerations should extend to deciding and implementing design standards, Keyes states. "With any new standards, users have to learn the changes. That's why you encounter resistance," she explains. Managers have to understand these internal politics, she says, and get the right people involved at the right time.

Hurst is a Computerworld Focus senior writer.

FRINGE BENEFITS!

Collect a big bonus when you subscribe to **COMPUTERWORLD** — 12 issues of **COMPUTERWORLD FOCUS**! Each issue deals in-depth with a timely topic: connectivity, communications, software, and more.

COMPUTERWORLD: up-to-the-minute news.
COMPUTERWORLD FOCUS: down-to-earth analysis. Get both!

To subscribe, complete the attached order form and mail in this postage-paid envelope. Or call 1-800-544-3712* for faster service.

*In PA call collect 215-768-0388

COMPUTERWORLD FOCUS

SOFTWARE IN THE
FAST LANE





NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55 SOUTHEASTERN, PA 19398

POSTAGE WILL BE PAID BY

CIRCULATION DEPARTMENT

COMPUTERWORLD

P.O. Box 1016

Southeastern, PA 19398-9984



BUYING DECISIONS

Mail-Order Micros Win Stamp Of Approval

BY • REBECCA • HURST

The best buy for the buck. Better service. Wider selection. These are the advantages some mail-order personal computer firms promote and deliver increasingly to corporate buyers.

The fastest growing section of mail-order PC buyers is the Fortune 2,000, claims Michael Dell, president of PC's Limited, an Austin, Texas-based mail-order firm. "Eighty-five percent of our machines are placed in business office sites," he says.

Mail order is a good distribution channel for corporate users, agrees Ian Warhaftig, a senior market analyst at Framingham, Mass.-based International Data Corp. (IDC) and a PC's Limited customer. "There's no sense in paying a computer specialty store's markup if you do not require the support it offers," he says.

Mail-order firms that manufacture their own IBM Personal Computer compatibles can save users 30% to 40% because they eliminate the reseller market cost, Dell notes. By contrast, personal computers from companies such as IBM or Compaq Computer Corp. sell chiefly through retail chains. Of course, IBM and Compaq answer large-volume requests with low-cost direct sales. Even so, some large corporate users are turning to mail-order houses.

Burlington Northern Motor Carriers, Inc. of Fort Worth, Texas, already had purchased



100 to 150 PC ATs directly from IBM when it decided to employ clones for a local-area network (LAN)-based order entry system, says Dennis Styles, Burlington's data center manager. "We felt the nature of our application went with the AT's capabilities," he explains. "We also knew that IBM's support was a carrot dangled in front of us. It was there, but it was difficult to get."

The problem was not maintenance, Styles says, but technical support. "We were doing some leading-edge things," he recalls, "but I wondered whether IBM would provide the support we required." In addition, Styles questioned the conditions of

buying directly from IBM. "IBM's volume purchase agreements make us duty bound to buy a certain amount of machines," he explains. "But, we're in a dynamic environment, and I didn't know how many we would need."

After evaluating different AT clone vendors, Burlington chose PC's Limited and installed approximately 80 to 100 units, Styles estimates. "PC's Limited offered pretty good support," he explains. However, the firm needed "national support because our computers are spread [throughout] five states." To provide more extensive support services, Styles contracted Min-

neapolis-based National Computer Systems, Inc., a computer maintenance organization that was willing to service PC's Limited machines. Since that time, three or four other companies have asked National Computer to support PC's Limited products, he says.

Even without the National Computer contract, Styles says, he still would have gone with PC's Limited. "I figured that if we didn't get a service organization, we could afford to have four or five hot spares lying around in case we had to send a faulty PC back to the company," he explains. "They're inexpensive enough that the justification is just fine."

For companies purchasing smaller volumes of PCs, a chief concern is the business relationship a manager has with a retail store or mail-order firm. "Mail-order firms have far more knowledgeable people than retail stores," claims E. Allan Cariker, director of computer systems for the Dallas Cowboys Football Club, Ltd. in Irving, Texas.

Mail-order companies are also more helpful, Cariker says. "Mail-order people are much more motivated to help you get the answers you need, even if that means telling you to buy from someone else." Retail sales people tend to use delay tactics such as saying they will get back to you, he comments. Also, mail-order vendors will accept a

BUYING DECISIONS

user's description of a computer problem and take action, Cariker notes.

On the other hand, the retail channel can work for business users. The Dallas Cowboys use a combination of name-brand PCs from a local retail store and IBM PC AT and XT clones manufactured and sold by PC Designs, Inc. of Tulsa, Okla. These systems primarily are used for general office applications such as word processing, accounting and data base management. "If I need something right away, I'll use a local dealer because I can usually get a good deal," he says.

The relationship with this dealer works well, in part because of Cariker's tenure as a customer. "The man has dealt with me enough that there are no questions asked," he explains.

Beyond service, another reason for going the mail-order PC route is simply the ability to get the configuration that is right for you. PC Designs' clones are not standard configurations, Cariker explains. For example, some users require high-resolution or desktop publishing monitors and retail stores may not be able to provide these components easily, he says.

The availability of components was also a factor behind Burlington's decision to buy from PC's Limited, according to Styles. At first, Styles evaluated AT clones from Tandy Corp. as well as PC's Limited; however, Tandy could not provide the fully configured system he specified. "We wanted an IBM 5251 terminal emulation card so the PCs could talk to

an IBM System/36 or 38," Styles explains. "Tandy didn't have the card, and we didn't want to dedicate our resources to putting them in ourselves." Styles opted for PC's Limited, which purchased 5251 emulation cards from Ideassociates, Inc. and installed them in the micros before shipping them to Burlington.

Too much work for MIS

The desire of Burlington and the Dallas Cowboys for complete systems is shared by most corporate users. A fully configured system should include a monitor, monitor card and serial and parallel ports in addition to the CPU. "MIS directors don't want to bother with building these systems," IDC's Warhaftig states. "They're working 12 hours a day to get their current work done; they don't want any more."

However, corporations with technical or industrial applications often prefer to purchase PC components and build customized systems. DP managers from such companies turn to specialized mail-order firms that provide particular casings, cards, coprocessors and peripherals along with PC-compatible CPUs.

"We don't sell a plain vanilla PC," says Chuck Philiyaw, president of ICS Computer Products, Inc. in San Diego. Instead, the systems are often rack mounted and come with a 32-bit coprocessor and 50M to 60M bytes of memory. "A lot of engineering applications are number intensive and load down the PC," Philiyaw explains. Also, the large amounts of memory used require more processing power.

Mail-order firms such as ICS will act as systems integrators and provide fully configured computers, but many customers choose to build the systems themselves. "Our customers are typically engineers," Philiyaw says. "They like to fiddle with things and customize PCs to suit their purpose."

The Woods Hole Oceanographic Institution in Woods Hole, Mass., purchased components from ICS to build a customized PC that controlled Jason Jr., a vehicle that photographed the *Titanic* shipwreck last summer. "We were already familiar with the PC," explains Jim Newman, a research engineer at Woods Hole. The PC had a twofold purpose, he says. Receiving information from sensors and the joystick that directed Jason, the computer would decide what commands to give the vehicle. In addition, the computer displayed this information to scientists on the ship.

The CPU of the PC that drove Jason was a standard Intel Corp. 8088 with an 8087 coprocessor. However, to be shipshape for the demands of the high seas, the system had to meet several special requirements. "The PC had to be rack mounted, and we wanted a bubble memory disk for reliability," Newman says. "We didn't want a keyboard or any movable parts such as a floppy or hard disk drive."

Initially, Woods Hole looked at IBM's rack-mounted computers, but the institution realized that it would have to go to outside sources for some of the other components, Newman recalls. Then, out of the blue, Newman received an ICS catalog. With ICS, Woods Hole could buy everything it needed from one place, he reports. The institution ordered two PC systems from ICS, one as a backup. "We never needed the backup, but losing a diving expedition costs a lot more than the computer, so we don't just take one of anything," Newman explains.

The computers came as individual parts that plugged into the chassis, but Woods Hole customized the PCs further. "We built an interface board that conditioned the signals coming in from the sensors, added a plug to the chassis and disconnected the ac ground," he reports. "We also added a custom-built graphics card that superimposes video and graphics on a monitor."

Significant cost savings

One experience all three users shared was a significant cost savings. Burlington saved about \$1,000 to 1,500 on each of its IBM Personal Computer AT clones, according to Styles. The Dallas Cowboys' Cariker reports similar savings for the football club's AT clones and savings of \$600 to \$800 for its XT clones. For ICS's rack-mounted PC, Woods Hole's Newman reports even greater savings in the neighborhood of \$3,500 over IBM's machine.

While cost is a primary issue for users, it is not to the exclusion of other factors. "There are a lot of mail-order systems out there, but many don't fit the needs of the MIS director in terms of proven name and service," Warhaftig asserts. "I wouldn't buy from any mail-order house, only a few. I don't want a product that's going to give me headaches in two months."

Cariker concurs, saying, "I've bypassed many mail-order firms. I checked the background on PC Designs before buying from the company. I believe they want to deliver a high-quality product at

a good price."

However, even reputable firms are likely to raise the eyebrows of upper management. Mail-order computer houses are relatively unknown to corporations, and they don't offer the Big Blue security blanket of IBM. "Management instantly had questions when I decided to go with PC's Limited," Styles reports. "But the organization let me go ahead based on my experience."

While all the users who spoke with *Computerworld Focus* were happy with their mail-order PCs, each reported minor problems. These were primarily compatibility issues common among clones. In some cases, the mail-order vendors quickly provided solutions. In others, users adjusted their use or choice of software.

For example, the BIOS chip on the enhanced graphics adapter card in Warhaftig's PC's Limited computer did not run Microsoft Corp.'s Flight Simulator. However, PC's Limited sent him a replacement BIOS chip that should alleviate the problem, he reports. In addition, Warhaftig's mail-order system has 1M byte of random-access memory. That is a problem for Microsoft Corp.'s Windows, which was written for 640K bytes of memory, he says. "The software gets mixed up by the extra memory," Warhaftig explains. "I solve the problem by loading the system with software; then it works fine."

Burlington also has a software compatibility problem. "Our PC's Limited computers work in all but one situation," Styles reports. "We couldn't use IBM Basic, so we had to go with [Microsoft Corp.'s] GW-Basic."

Motherboard problems

Also, a problem with the systems' motherboard required help from PC's Limited, Styles recalls. The PCs at Burlington are connected to Novell, Inc. LANs through network interface cards. The first PC's Limited AT clone worked fine, but a second test group of four or five computers had different motherboards that were incompatible with the network interface cards, he says.

Thinking the problem was in a read-only memory (ROM) chip, PC's Limited sent Burlington several versions of ROM chips before discovering that the problem lay in the vendor's mini I/O card. Once the mail-order firm switched the settings on the proprietary card, the computers worked in any network configuration, Styles says.

At the Dallas Cowboys headquarters, Cariker discovered that his PC Designs computer would not support the Control Data Corp. 86M-byte disk drive he had installed. "I called PC Designs, and they sent me a new chip overnight," he says.

Users were generally satisfied by the support and response they have gotten from their mail-order vendors, although Burlington's Styles notes that there is room for improvement. "When I call PC's Limited about a problem, I can't go to the person I talked to before," he explains. "IBM is willing to appoint one person who is responsible for my account and any problems I have."

Styles attributes the problem to the mail-order firm's inexperience in dealing with large corporate accounts. "I think it's gotten better," he says, "but this is one area in which the company has to grow to meet large corporate demand."

Hurst is a Computerworld Focus senior writer.

REACH THE NUMBER ONE COMPUTER MARKET IN WESTERN EUROPE - W. GERMANY.

Our West German publications cover all segments of this prospering marketplace.

PC Welt is read by 26,000 West German, Austrian and Swiss IBM PC users each month.

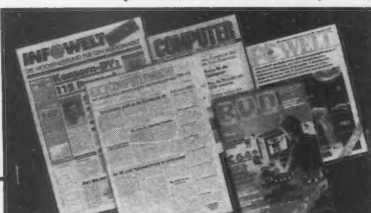
Computer Business circulates monthly to third-party marketers.

98,000 Commodore owners and buyers read Run each month for reports on the Commodore marketplace.

Each week, 22,500 micro-computer users read InfoWelt for the information they need.

30,000 West German MIS/DP professionals rely on *Computerwoche* for up-to-date analysis and market information.

CW International Marketing Services makes advertising your products in West Germany, and around the world, easy. We have over 55 publications in more than 25 countries. For more information on our wide range of services, complete the coupon below and mail it today.



Please send me more information on:

☐ Computerwoche ☐ InfoWelt ☐ PC Welt

☐ Computer Business ☐ Run

☐ Your other foreign publications

☐ Your brochure "The Computer Marketplace in West Germany"

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

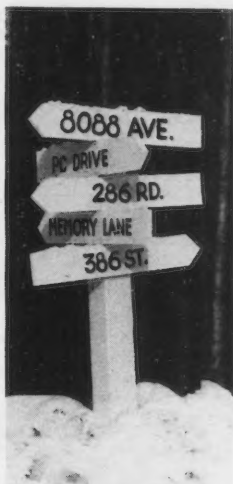


CW COMMUNICATIONS, INC.
Frank Curtina
Managing Director
International Marketing Services
CW Communications, Inc.
375 Cochituate Road
Framingham, MA 01701-9171

UPGRADE PLANS

Routes To System Upgrades

BY • AARON • GOLDBERG



Extending the life of an organization's personal computer investment is key in these cost-conscious times. Innovations are forcing companies to keep up or flounder, but such products are not cheap. MIS is searching for ways to upgrade existing PC systems and get them ready for the next-generation technology.

Currently, it is not extremely complicated to enhance the utility of existing systems purely for performance. There are two reasons why MIS would get involved in such a move. The first reason is to make older, slower systems more functional for users unhappy with systems performance.

The second reason, and focus of this article, is to take existing products and position them for the new operating environments that should be announced soon.

Before embarking on such an upgrade venture, MIS must understand the categories into which each of its systems falls. It must forge a plan for personal computer usage in which there is clear justification for either a Microsoft Corp. MS-DOS 3.1 performance upgrade or a system replacement with the company's anticipated Advanced DOS or 386 DOS.

MIS must answer preliminary questions before choosing hardware and software. Often, the tendency is to skip the initial steps and just choose the products.

But, until MIS managers discover the answers to the following queries, they should not take out their checkbooks or purchase orders:

■ Do you have a true picture of each application and its use to

gauge the need for new environments like Advanced DOS or 386 DOS, and when this need will occur?

■ Do you understand the different PC user types? What are the various needs of power users, support personnel, plant managers and so on?

There is no longer a viable corporatewide standard product in any product area because of the individuality of use and application.

■ Is there a way you can pass down older systems to nonusers or users now sharing PCs, rather than trying to retrofit the systems?

There is a rather smug school of thought that says that the present MS-DOS operating environment is so rich and full that no one could ever need more. This may be true for some groups of users, but technology will always march onward.

Connectivity will always play a large role in upgrade issues. A plan for varying levels of connection must exist as well as for how the integration will be structured.

For instance, MIS managers must take into account whether a user needs four bottom-line numbers monthly from a print-out or the ability to run microcomputer versions of mainframe products like Information Builders, Inc.'s Focus or even IBM's future DB2 product.

The next step in discussing a personal computer's upgrade potential is to outline the options and time frame for moving to the next-generation environments. There will be five distinct operating environments: the existing Microsoft MS-DOS 3.1 product set; IBM's new low-end graphics systems; the Apple Computer, Inc. Macintosh; Advanced DOS with greater than 640K bytes of addressable memory and Intel Corp. 80286 protected mode; and the Intel 80386 personal computer operating systems.

The IBM graphics systems should be introduced any day now. This set of products reportedly will use all of the existing MS-DOS or PC-DOS software, will utilize a standard graphics environment (could this be Microsoft Windows' big break?) and will have device drivers for some IBM-developed, application-specific integrated circuits.

This architecture can be viewed as an extension of PC-DOS. Technical capabilities will be virtually identical in terms of memory addressability and system performance.

UPGRADE PLANS

The Macintosh is now a true contender for business microcomputer applications (see story page 21). In many companies, it is impossible to get two hours on a Macintosh, while some IBM Personal Computers sit idle. With Appleshare and the 3270 links that were introduced and some better hooks to the IBM PC-DOS and mainframe worlds, Apple will be the machine of choice, one that cannot be overlooked.

The much-rumored Advanced DOS will provide the first real improvement in MS-DOS's capabilities, but upgrades are likely to be difficult. Advanced DOS will allow the program area to expand beyond the 640K-byte limitation and will make available true multitasking.

A brick wall between environments

On the negative side, old applications will not run in the Advanced DOS mode. The only way to run old applications on an Advanced DOS machine will be to run them as only one task with the 80286 system booted as an old MS-DOS operating system.

There is no chance of loading up a bunch of old applications to run in the available megabytes of memory there are now. There will be a brick wall between the old environment and the new. Applications will have to be rewritten to the level of new binaries to run in the Advanced DOS mode.

The Advanced DOS operating environment should hit the market during the third quarter of 1987, but the confusion surrounding the operating system will likely start much sooner.

The furthest development on the horizon is an 80386 version of the MS-DOS environment. This 80386 product will likely have the best upward migration for existing MS-DOS 3.1 applications because of the virtual machine mode of the 80386.

zations should take for the future. Therefore, the problem becomes how to get to Advanced DOS or 386 DOS from a firm's current environment.

Some of you may ask, 'Why not just upgrade old systems into the new environment?' This is not a useful way to deal

these changes with modifications to old systems will be equivalent to planting a time bomb for the support organization.

Timing is everything. System migrations should be done when products and applications — not technocrats — demand it. The first vestiges of Advanced DOS will not come before the end of summer and Advanced DOS-based applications products (in any number) will not be available until at least six months after that time. Therefore, there is still about one year to make plans for the product's impact.

In addition, MIS has about one more year after the advent of Advanced DOS before 386 DOS becomes part of the mainstream.

Migration is painful

It is clear that migrating from today's environment to Advanced DOS will be painful, and going from Advanced DOS to 386 DOS will be no less difficult. Therefore, the key question is, What should your company do, hold off for another 18 months and wait for 386 DOS or use Advanced DOS when it is available this fall? Unfortunately, there are no pat answers.

Moving to Advanced DOS will have some important advantages for those that choose this route. It will provide an immediate relief from the 640K-byte limit.

It is also expected to run on existing Personal Computer AT-class systems with little or no hardware changes. Advanced DOS will also allow users to run existing applications on the same system

The much-rumored Advanced DOS will provide the first real improvement in MS-DOS's capabilities, but upgrades are likely to be difficult.

Most major vendors and system software companies say that the 80286 will enjoy less than half of the 10-year useful lifetime that they ascribe to the Intel 8088, 8086 and 80386. Indeed, it is this issue of transition from 286 to 386 that is the most puzzling and will have the most impact on system migration. The 386 operating environment will not likely be released before first-quarter 1988.

The real question for systems professionals will be what to do for the upgrade from existing MS- or PC-DCS applications to either the 286 or 386 environments.

The point is moot

Macintosh installations will render this point moot, and the low-end graphics path is not a direction that large organi-

with more than a handful of systems. What you will be trying to do is take a compatible system, add compatible boards and compatible software to create a system compatible with a new environment.

In the best case, you will have a compromise system that is usable, but still costs an average upgrade configuration price of \$2,000, and in the worst case, the resulting setup will not work at all. Considering that the migration from 286 systems to 386 systems may happen in less than two years, will you want to go through another upgrade?

The maxim that "The installed base is gold" fits for nearly all companies but I believe that view is shortsighted. The changes in the MS-DOS environment will be massive, and trying to approximate

Introducing the Epson® Equity™ III+

The balance of power has shifted. In the world of AT²-compatible technology, the new force is the Epson Equity III+. It will give your users all the performance they need, and then some.

A three speed 80286 microprocessor overwhelms the IBM® PC/AT with 6, 8, or 10 MHz, operating 25% faster than IBM's best. That's beyond number crunching. It's number pulverizing. And while the Equity III+

The Epson Equity III+, shown here with optional expansion boards and monitor.

UPGRADE PLANS

in much the same way as today.

Advanced DOS's positive points are primarily in leveraging existing hardware platforms and maintaining some ties with the past. For companies that have segments of end users who are already past the breaking point in terms of MS-DOS limitations, the near-term relief is an important selling point. There should be some interesting applications that will also be developed for this environment. Improvements in operability and the number of options in a specific software product are sure to be main features.

On the negative side, Advanced DOS will have some important limitations. First, backward compatibility will be achieved at the expense of allowing new applications to run. Moving from the old to new environments essentially involves rebooting the system, although this action may not appear as such to the user.

As for hardware, the 80286 is not nearly the ground-breaking processor design that the 8088 or 80386 embody. There are a number of recurring bugs in the processor design that Advanced DOS is proving especially adept at finding.

While the 286 clearly offers the best hope for expanding MS-DOS's limits, this is merely a short-term solution. Long-term efforts almost exclusively surround the 80386 camp. Concerns about Advanced DOS/80286 consist of long-term viability and the amount of software development for the 286 vs. the 386.

It is folly to predict that the PC market

will make a major change to one of these environments followed by another major change to a different environment a scant two years later. While it is expected that virtually every major software and hardware developer will have Advanced DOS products, these offerings may merely be

80386 chip.

Clearly, benefits surround the landmark advances in the 386 design. There is no doubt that the 386-based systems will outperform the 286 systems; taking advantage of this fact will be a major factor in the success of 386 DOS.

”

The PC upgrade issue is only clear in a few aspects. Two things that do appear certain are that trying to retrofit 8088-based systems is not a wise use of money and that planning for this major system-level upgrade is crucial.

rewrites of existing applications and waystations in the product development cycle with true innovation saved for the 386 DOS.

The issue of 386 DOS is a little harder to evaluate with certainty, given that the product is not yet even fully specified.

On the plus side, 386 DOS will take advantage of full 32-bit addressing; use 386-specific instructions, such as the 4-byte fetch, which will improve applications speed significantly; utilize the virtual mode of the 386 to provide multiple 8086 tasks; eventually allow for a combination of operating environments, such as MS-DOS, Unix and, perhaps, VM on a single system; and take advantage of the truly awesome performance of the Intel

On the down side, 386 DOS is currently vaporware. In all fairness to Microsoft, it should not be expected that developing as complex a piece of software as 386 DOS would happen overnight, but it is difficult for MIS to plan for an unannounced product far in advance.

In addition, the cost of 386-based hardware platforms is significantly higher than 286-based products, and the range of vendors supplying 386 systems is far narrower. There is also the specter of IBM doing some sort of proprietary add-on to a 386 system that would make buying clones even more confusing.

Primarily, the major problem with the 386 environment is the uncertainty that surrounds it. The 12-month lag time be-

tween now and the first possible announcement makes it difficult for MIS to choose the right upgrade path.

The PC upgrade issue is only clear in a few aspects. Two things that do appear certain are that trying to retrofit 8088-based systems is not a wise use of money and that planning for this major system-level upgrade is crucial.

No set upgrade rules

Unfortunately, there is no single general rule that will allow MIS to make the most correct upgrade choice. This problem is exacerbated by the fact that within the same companies there may be some departments or groups needing the immediate relief of the 286 environment, while other groups can be perfectly content to wait for the 386 environment. It is crucial to make planning allowances for these differences.

Such a change will exact a toll in the areas of support, training and new software rather than just in system expenditures.

Therefore, MIS should not make the decision concerning an upgrade lightly. Weigh options carefully because the migration path of your firm's PCs will have long-standing impact on the corporate information systems well into the next decade. E

Goldberg is vice-president of microcomputer services at International Data Corp., a market research firm based in Framingham, Mass. He has developed strategic implementation plans for end users.

POWER.

comes with a standard 640 K RAM, you can take it all the way up to a head-snapping 16 megabytes.

To customize an Equity III+, there are nine expansion slots, each with rear panel access. Need hard disks? Floppies? Streaming tape back-up? Equity III+ gives you slots for five half-height mass storage devices.

With Epson's innovative modular chassis, the Equity III+ is designed to be state-of-the-art for years to come. There are two extra ROM sockets for your custom firmware; and to boost numerical horsepower, just pop an 80287 co-processor

into the waiting socket. The system board even slides through the front of the chassis for easy access.

Plug in your favorite AT-compatible software and see how the Equity III+ handles. It not only runs faster, it runs smoother too. Because we've improved MS-DOS[®] 3.2 with a better user interface, plus utilities that are more than utilitarian.

And for the inevitable user questions, the Equity III+ comes with some of the finest, clearest, best written, most complete documentation ever shrink-wrapped.

One last innovation. With Epson's legendary reliability, and our one-

year limited warranty, the power of the Equity III+ would be a bargain at any price.

At Epson's price, it's a steal.

For more information about the Epson line of personal computers and printers, call (800) 421-5426.

Epson is a registered trademark of Seiko Epson Corporation. Equity is a trademark of Epson America, Inc. IBM and AT are registered trademarks of International Business Machines Corporation. MS-DOS is a registered trademark of Microsoft, Inc.

EPSON

COMPUTERS

It's Monday morning. Your

8:30 A.M. ♦ TOKYO, JAPAN

IDG's International Data Corporation managing director **Yugi Ogino** is stopped in his tracks by a flash report on the company's International News Service. *Digital News* has just spotted a potential challenge to IBM's grip on the professional PC market: DEC has announced their Local Area VAX Cluster. Ogino sets up a conference call with *Computerworld Japan* editors to brief them on his analysis.



8:40 A.M. ♦ SYDNEY, AUSTRALIA

At almost the same moment 4,300 miles to the south, *Computerworld Australia* publisher **Susan Coleman** sees the DEC story on her news wire. She calls in **Peter Scott**, her editor, to plan editorial coverage for their market.



11:00 A.M. ♦ HELSINKI, FINLAND

Halfway around the world, **Timo Tolsa**, editor of IDG's Finnish computer newspaper *Tietoviikko Ky*, faxes his comments on the pending story to **Dieter Echbauer**, editor of *Computerwoche* in Germany, who appoints an editorial team to file a comprehensive story for use by all five IDG publications in Germany.



10:10 A.M. ♦ BUENOS AIRES, ARGENTINA

Ruben Argento, the head of IDG's *Computerworld* newspaper in Argentina uncovers a new wrinkle in the rapidly unfolding story—and alerts Doane Perry, senior market consultant at IDC in Framingham, Massachusetts: a DEC competitor in South America is developing a similar cluster product.



world just changed again.

10:30 A.M. ♦ BOSTON, MASSACHUSETTS

IDG reporter **Kathryn Esplin** files a VAX Cluster story for *Digital News*. Her back-up analysis is sent to all publication offices around the world on the company's news wire.



2:00 P.M. ♦ FRAMINGHAM, MASSACHUSETTS

Perry meets with **Bill Ford**, IDC Information Industry Services Chief, to plan a global research report on computer clusters and their potential impact on business users.



4:45 P.M. ♦ PALO ALTO, CALIFORNIA

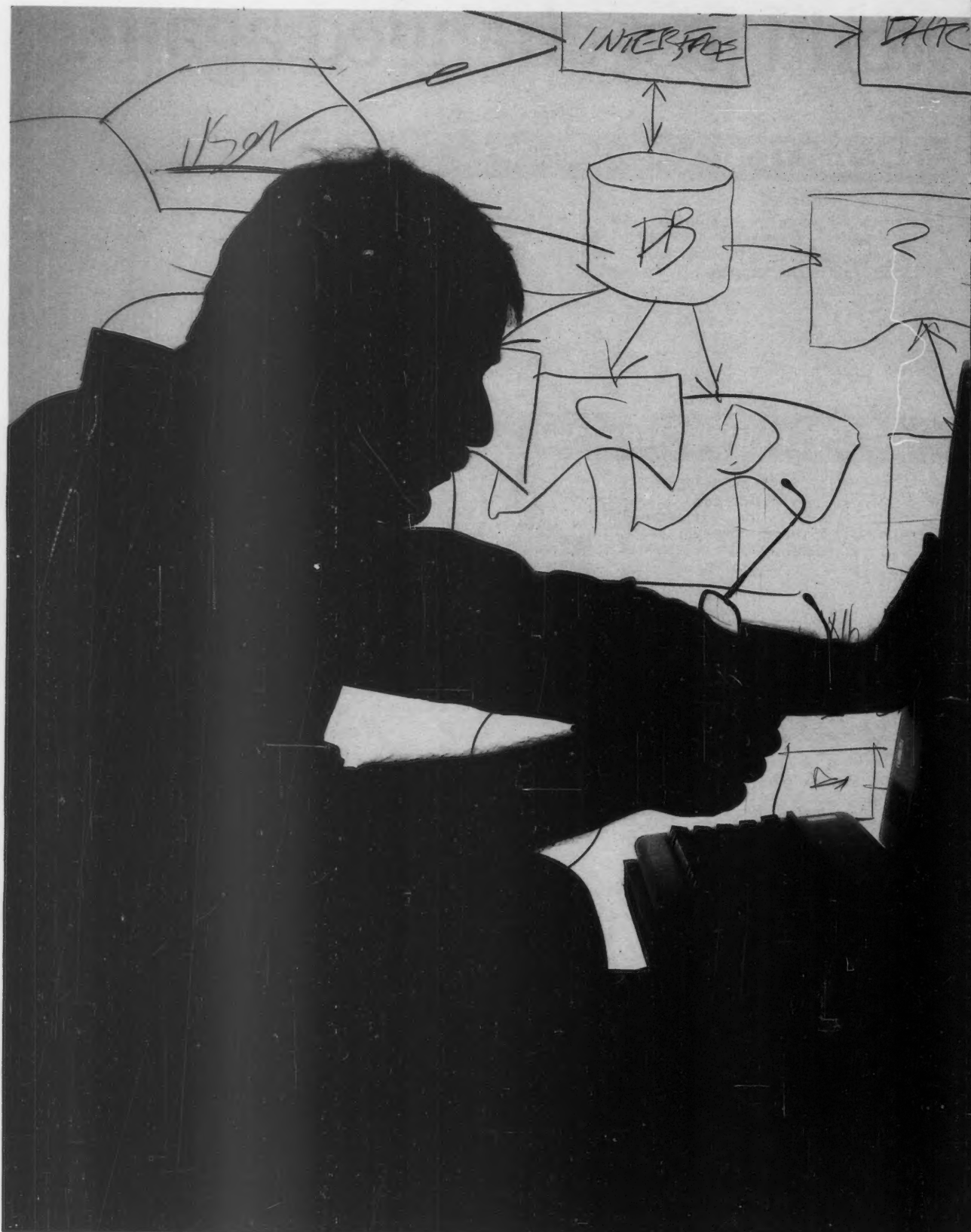
IDC Research Director **Jean Yates** faxes detailed schedules of the report requirements to IDC research centers in 16 other countries. Deadline: 1 week. Overnight mail announcements of the pending report are mailed to IDC's top 1,000 customers around the world.



International Data Group

80 magazines
28 research centers
16 languages
1 world.

IDG, The World's Leading Provider of Information Services on Information Technology.
Five Speen Street, Framingham, MA 01701 • (617) 875-5000 • Operating Companies: International Data Corporation (Research) • CW Communications Inc. (Publishing)



MANAGEMENT STRATEGIES

The Strategist And The PC

Is the PC an executive's key weapon for winning the great information battle?

BY • MICHAEL • TUCKER

PCs are a *strategic* resource.

Heard that one before?

Even before IBM Personal Computers started showing up in such overwhelming numbers on the desks of business users, industry pundits and trade press mavens proclaimed the machines as the new strategic corporate resource.

Personal computers, went the argument, would be part of the attack. By giving every information worker the ability to perform corporate analysis of local data at local sites, desktop computers would thus increase the productivity and competitiveness of U.S. industry.

The idea of the PC as a strategic resource is simple to the point of classical elegance. Explains Bill Kirwin, director of personal computer policy and strategy at Stamford, Conn.-based market research firm Gartner Group, Inc., "What people are trying to say by 'strategic' is that they're treating information as if it were an asset, . . . indeed, an asset like any other, which can be measured, quantified and otherwise treated as though it were no different from capital or raw materials. It's a way of gaining a competitive advantage."

According to Kirwin, there are several different ways to make a company more competitive. "You can lower your labor costs, manage your capital more effectively, manage your raw materials more effectively and so on. But most American companies have already done that, and they've squeezed out about as much as they're going to get from traditional assets. . . . Now they're turning to information to give them an edge," he says.

This awareness of information as a tool has produced first, a new profession, that of the chief information officer, and second, a new concept, the PC as a strategic weapon.

In the ideal case, the PC becomes a desktop data cruncher for the individual executive.

The personal computer allows each and every decision maker to perform specialized analysis of very large data bases, data that could not be examined cost-effectively either by the individual working without computing power or by an MIS department already overwhelmed by more pressing DP tasks such as payroll. "You can identify opportunities that would never have been discovered," Kirwin says.

But are MIS and users in organizations around the country actually using

the PC as a strategic weapon?

In a position to know something about the way microcomputers are being used in the world is the U.S. Department of Commerce. Its Office of Productivity, Technology and Innovation (OPTI) is an organization set up precisely for the purpose of introducing innovative techniques to U.S. industry.

OPTI's director of international operations, G. T. Underwood, notes, "My own observation is that if we set aside the real technologists — that is, scientists and engineers — and the financial industry, which has made a real commitment to the machines, then in the business world there are only two areas where people are using computers to increase their productivity, and those areas are word processing and spreadsheets. But, for average middle managers, well, yes, they've got a computer, but as a rule, they're underusing their machines."

A very similar response comes from the market research firm International Data Corp. (IDC) located in Framingham, Mass. Will Zachmann, IDC vice-president of research and technical assessment says bluntly, "Nobody who buys a PC or anything else, for that matter, is going to say they're just throwing the money away, but, *strategic*? Well, I think it's a nice buzzword."

As for MIS, it tends to be every bit as harsh as the analysts. According to Raymond J. Russell, manager of information systems for New Orleans-based Amoco Production Co., "I would say that all our tools are strategic, but I can't say that I can isolate the PC and say it's more strategic than all the others."

What accounts for the failure of the personal computer to become the intercontinental ballistic missile instead of just the short-range rocket of the business world? Some observers suggest that the problem is inherent in PC technology. OPTI's Underwood suspects the bottleneck may be the keyboard, and if something could be found to replace it, middle managers would be more likely to use the machines.

"Changing the interface media would make an enormous difference. . . . If we could come out with a workable voice response system or something else that looked a bit less secretarial, then the middle managers — the [managers] who are 50 years old or so — will find it easier to relate to," Underwood says. However, he adds, it would probably be easier to keep



INTRODUCING FUJITSU'S DX FAMILY OF PRINTERS

TAKING PC PRODUCTIVITY TO NEW HEIGHTS

Choose the 80-column DX2100, or the 136-column DX2200. For sheer print volume, these Fujitsu printers can't be topped. At 110 lines per minute, their throughput is almost double that of most major competitors.

The built-in bi-directional tractor speeds paper handling too. Just flick a switch to go from continuous forms to single-sheet feeding; without removing cumbersome optional tractors or tractor paper.

The well-designed operator panel gives you fast, convenient control of all printer functions; and enables you to identify error conditions quickly.

DX printers won't distract you from your work either—thanks to their quiet operation at less than 55 dBA.

And in addition to fast spread sheets, Fujitsu's DX printers produce near-letter-quality print and excellent graphics. They'll grow with your needs, too. Upgrading to color, or changing your system interface, is as easy as plugging in a new module.

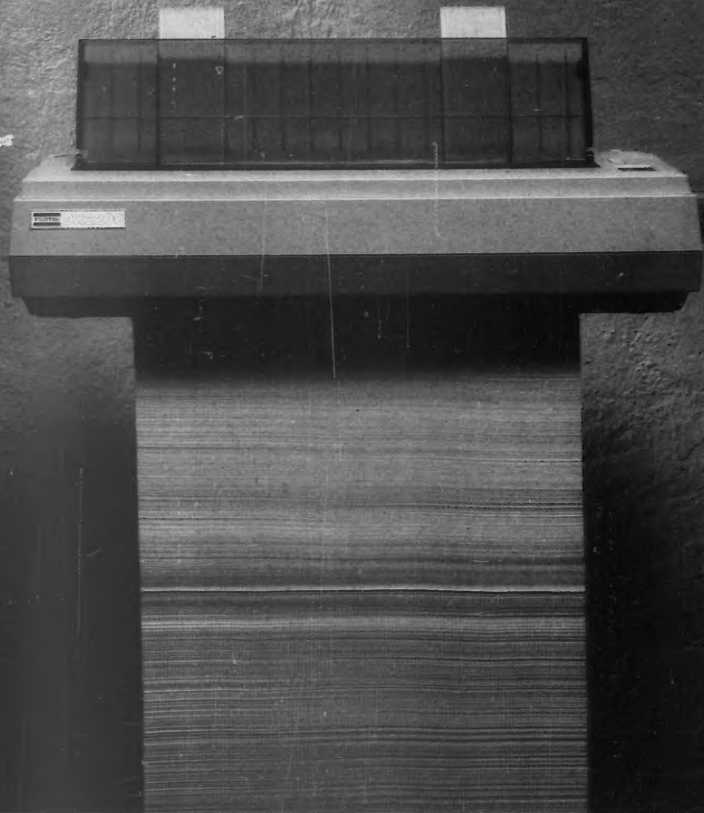
You can put these fine printers to work for a lot less than you might expect. And it costs next to nothing to keep them working. They come with a superb reliability rating of 6000 hours MTBF and a full one-year warranty.

For more information about the new Fujitsu DX family of printers, call Fujitsu America, Peripheral Products Division, at (800) 626-4686. Get the personal printers that really produce.

WE'RE DEVELOPING TECHNOLOGY FOR YOU.

FUJITSU

FUJITSU AMERICA



MANAGEMENT STRATEGIES

the keyboards, let the current generation of middle managers gradually drift up into upper management or retirement and replace them with executives who have grown up with computers.

'Every user considers them strategic'

There are also those who propose that the difficulty is at the other end of the PC, at the interface between micros and corporate mainframes. "We've got a lot of PCs, and every user considers them strategic," says a large investment bank's vice-president who asked that neither he nor his firm be identified. "But, until you get micro-to-mainframe links, particularly in the [IBM] CICS environment, there really isn't any way to integrate PCs into the strategic operation."

So, have we finally got an answer? Can we say that the strategic PC was a fantastic idea but one that was ahead of its time? Well, no.

Consider the case of Bruce G. Curry, director of the computer resources department at New York-based Big Eight accountancy, Peat, Marwick, Mitchell & Co. "There are a lot of questions of semantics," Curry says. "How do you define strategic and tactical? If a local manager uses his PC to do local planning, is that strategic? But, if I can confine myself to just the top management, leaving out local planning, then very definitely, we do regard PCs as strategic."

In fact, Curry explains, "one of our own vice-chairmen is using his PC in exactly that [strategic] way. He's taking companywide data — in some cases, industrywide data — and using his own machine to generate reports that are meaningful to him in his own specialized segment of the firm."

The vice-chairman can thus take tremendous chunks of raw information, such as detailed records of the services that Peat Marwick delivered to its last few thousand customers, winnow away the details that are unimportant to his own operation and search the remainder for previously undiscovered options to make a profit. It may be that he will be able to uncover the need for a product or service based on customer demand.

That description sounds exactly like what Gartner Group's Kirwin was talking about. So, then, can we say the strategic PC is here? Nope.

Personal, not corporate

If the Peat Marwick system is strategic, then it is exactly the sort of application that even the sternest critics of the word "strategic" propose for the corporate PC.

IDC's Zachmann, for instance, says, "PCs have usually been just exactly what their name suggests, *personal* not corporate. But that doesn't mean they cannot be extremely effective as part of a corporatewide information service."

Peat Marwick's system looks like a corporatewide information service with a vengeance. But, the kicker is that Zachmann does not define a corporatewide information service as being strategic.

Are PCs strategic? If we can't get an unwavering answer, let's take another look at our question. First of all, we've not really defined the word strategic. That is particularly unforgivable because Curry, who says his PCs are strategic, went out of his way to warn us that there are lots of questions about semantics. And, according to Amoco's Russell, who says his PCs aren't strategic, a strategic resource is "something that is going to have an effect on the bottom line of a

company, something that would have an adverse effect on the company by its absence." He adds: "We look at the data as being strategic, not the device that is used to read it."

Bingo.

How does Curry's department deal with the data going to its strategic PCs? MIS provides the users with all the basics by making certain that the data is standard across the firm.

There's a common theme here, isn't there? Curry and Russell disagree mightily on the value of local, desktop processors, but on the subject of information they are in complete agreement. Data, they say, is by definition strategic.

All of which suggests that asking, "Are PCs being used as a strategic resource?" is sort of like asking, "Which is more important to your corporate suc-

cess, ballpoint or felt-tip pens?" Just as what really matters is not the ink but whether the memo gets written, maybe it doesn't matter if executives perform strategic planning with a desktop system or a multiuser one, as long as the planning gets done, as long as managers have some means — terminal, PC, workstation, whatever — of getting at the relevant numbers and crunching them.

Whether the best method of bringing users and corporate information together is a PC or a terminal is a moot point. There are now so many PCs being used as terminals and so many smart terminals that look like diskless PCs that the distinction between the two types of devices is less clear. Increasingly, MIS simply assumes that ev-

eryone in its organization will be equipped with some kind of local processor that will eventually be called upon to communicate by some method with a corporate mainframe. Between those processors, the real strategic resource — information — will flow.

The corporate personnel charged with providing what Curry calls the "basics" of that resource are MIS officers.

So whether a personal computer itself is strategic may not really matter. The real issue, the one that could have an effect on the company's bottom line, concerns MIS management and staff. As controllers of the strategic information, they must learn to become corporate strategists. P

Tucker is Computerworld Focus features editor.



QMS-PS 800



ITT Qume ScripTEN



Texas Instruments OmniLaser 2108



Linotype Linotronic 300



QMS-PS 2400

The biggest names in desktop publishing all speak the same language.

These best selling laser printers all use POSTSCRIPT, the page description language from Adobe Systems.

Only POSTSCRIPT can combine text, line art, even digitized photographs on the same page. That's one reason more manufacturers use POSTSCRIPT in their laser printers and typesetters than any other language.

With POSTSCRIPT you also have the option of printing from a PC, Macintosh or mini/mainframe computer. So, you select the best laser printer for your company's desktop publishing needs, without making a once-and-for-all commitment to a single vendor.

But the freedom of choice doesn't end there. Hundreds of software programs, for an assortment of operating systems, support POSTSCRIPT printers.

Plus, POSTSCRIPT is the only device independent page description language. That means a document can be designed at your office then printed professionally at a higher resolution.

So, take your pick of laser printers. Just make sure it speaks POSTSCRIPT, the language of electronic and desktop publishing.

For the name of the manufacturer's sales representative in your area, call 415-852-0271.



POSTSCRIPT from Adobe. The magic behind desktop publishing.



NBI Model 908



Apple LaserWriter/LaserWriter Plus



Linotype Linotronic 100



DEC PrintServer 40



NEC SilentWriter LC-890



Diconix Digi 1/PS



Apollo Domain/Laser 26



Dataproducts LZR-2665



Texas Instruments OmniLaser 2115



Agfa-Gevaert P400PS



Laser Connection PS Jet

POSTSCRIPT is a registered trademark of Adobe Systems Incorporated. Other brand or product names are trademarks or registered trademarks of their respective holders.

CIRCLE READER SERVICE NUMBER 273

GET YOUR OWN COPY

Why wait? You can have your own copy of *Computerworld* delivered right to your desk every Monday for just 76¢ a week! Plus, we'll give you 12 issues of *Computerworld Focus*. Free.

If you're not the first name on your company's routing slip, chances are you're getting *Computerworld* too late. After all, there's nothing as old as yesterday's news. Let alone last week's.

Computerworld brings you page after page of up-to-the-minute news, hot off the press. Find out about trends and developments in the computer community — the companies and people who shake up the present and shape the future. Discover the latest in new products and new vendor-supplied releases. Read in-depth reports on important stories and analyses of major issues.

What does the next technological breakthrough mean to you? Which new systems and peripherals can you put to work in your company? What are the risks? What are the rewards?

Get all the MIS/DP news you need sent directly to you — while you can still use it. Subscribe to *Computerworld* for the low price of just \$38.95 for 51 information-packed issues.

12 Bonus Issues of *Computerworld Focus*.

Order *Computerworld* now and you'll also receive 12 issues of *Computerworld Focus* — absolutely free. Each issue takes an in-depth look at the hottest topics in the field. Software: Operating Systems, Connectivity, Communications. And more.

Money-Back Guarantee.

If you should decide, for any reason, that *Computerworld* is not for you, tell us. We'll refund your money on all unmailed issues. No questions asked. No strings attached.

Stay on Top.

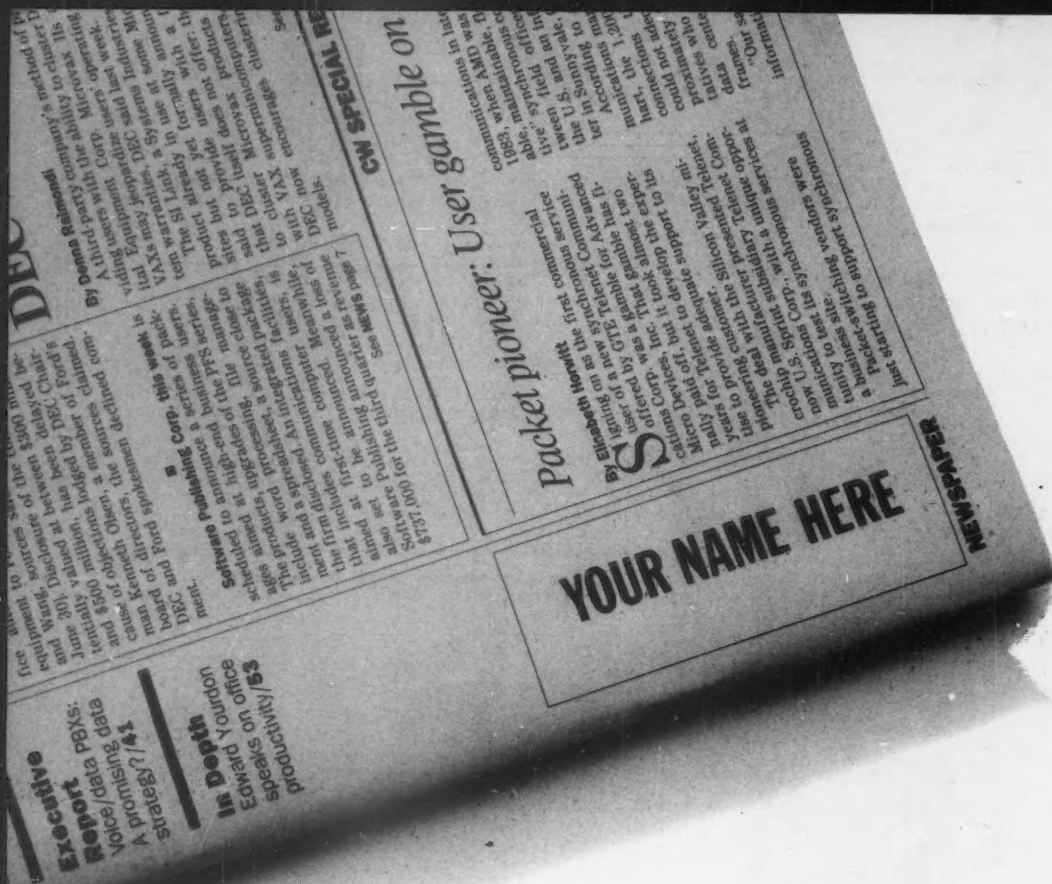
To stay on top of the latest news and ideas in the computer community, you must stay on top of the routing slip. Get your own copy of *Computerworld* — 51 weeks a year for only \$38.95.

Call toll-free 1-800-544-3712 (in Pennsylvania, call collect 215-768-0388) to get your very own copy of *Computerworld* delivered to your desk every week.



COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY



COMPUTERWORLD FOCUS

Reader Service Cards

fill out these reply cards and circle the numbers that correspond to the numbers on advertisements and editorial items that are of interest to you.

Computerworld Focus Reader Service Card

(3)

Issue: March 4th / Expires May 13, 1987

Name _____ Title _____

Company _____ Phone () _____

Street _____

City _____ State _____ Zip Code _____

A. Please check the business/industry in which you work: (check one)

- End Users
1 ☐ Manufacturer (other than computer)
2 ☐ Finance/Insurance/Real Estate
3 ☐ Medicine/Law/Education
4 ☐ Wholesale/Retail/Trade
5 ☐ Business Service (except DP)
6 ☐ Government — State/Federal/Local
7 ☐ Public Utility/Communication Systems/Transportation
8 ☐ Mining/Construction/Petroleum/Refining
9 ☐ Other User _____ (please specify)

Vendors (please specify)

- 10 ☐ Manufacturer of Computers, Computer-Related Systems or Peripherals
11 ☐ Computer Service Bureau/Software/Planning/Consulting

- 12 ☐ Computer/Peripheral Dealer/Distributor/Retailer
13 ☐ Other Vendor _____ (please specify)

B. Please check your main job function: (check one)

- 1 ☐ Corporate Management
2 ☐ Financial Management
3 ☐ MIS/DP Management
4 ☐ MIS/DP Operations
5 ☐ Data Communications Management
6 ☐ Data Communications Operations

C. Reason for this inquiry: (check one)

- 1 ☐ Immediate purchase
2 ☐ Future purchase
3 ☐ Information only

D. Is this your personal copy of Computerworld Focus? (check one)

- 1 ☐ My personal copy
2 ☐ I'm a pass-along reader

E. Please check the number of employees in your company: (check one)

- 1 ☐ Over 1,000 employees
2 ☐ 501-1,000 employees
3 ☐ 500 or under

Circle the # that corresponds to the number at the bottom of the item in which you are interested.

1	21	41	61	81	101	121	141	161	181	201	221	241	261	281	301	321	341	361	381
2	22	42	62	82	102	122	142	162	182	202	222	242	262	282	302	322	342	362	382
3	23	43	63	83	103	123	143	163	183	203	223	243	263	283	303	323	343	363	383
4	24	44	64	84	104	124	144	164	184	204	224	244	264	284	304	324	344	364	384
5	25	45	65	85	105	125	145	165	185	205	225	245	265	285	305	325	345	365	385
6	26	46	66	86	106	126	146	166	186	206	226	246	266	286	306	326	346	366	386
7	27	47	67	87	107	127	147	167	187	207	227	247	267	287	307	327	347	367	387
8	28	48	68	88	108	128	148	168	188	208	228	248	268	288	308	328	348	368	388
9	29	49	69	89	109	129	149	169	189	209	229	249	269	289	309	329	349	369	389
10	30	50	70	90	110	130	150	170	190	210	230	250	270	290	310	330	350	370	390
11	31	51	71	91	111	131	151	171	191	211	231	251	271	291	311	331	351	371	391
12	32	52	72	92	112	132	152	172	192	212	232	252	272	292	312	332	352	372	392
13	33	53	73	93	113	133	153	173	193	213	233	253	273	293	313	333	353	373	393
14	34	54	74	94	114	134	154	174	194	214	234	254	274	294	314	334	354	374	394
15	35	55	75	95	115	135	155	175	195	215	235	255	275	295	315	335	355	375	395
16	36	56	76	96	116	136	156	176	196	216	236	256	276	296	316	336	356	376	396
17	37	57	77	97	117	137	157	177	197	217	237	257	277	297	317	337	357	377	397
18	38	58	78	98	118	138	158	178	198	218	238	258	278	298	318	338	358	378	398
19	39	59	79	99	119	139	159	179	199	219	239	259	279	299	319	339	359	379	399
20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

☐ I have circled #400 on the Reader Service Card to enter my Computerworld subscription for one year, 51 weekly issues and 10 Computerworld Focus issues for \$44 and please bill me later. This rate valid only in the U.S.

Place
Stamp
Here

Computerworld Focus

Post Office Box 300
Dalton, MA 01227-0300

Computerworld Focus Reader Service Card

(1)

Issue: March 4th / Expires May 13, 1987

Name _____ Title _____

Company _____ Phone () _____

Street _____

City _____ State _____ Zip Code _____

A. Please check the business/industry in which you work: (check one)

- End Users
1 ☐ Manufacturer (other than computer)
2 ☐ Finance/Insurance/Real Estate
3 ☐ Medicine/Law/Education
4 ☐ Wholesale/Retail/Trade
5 ☐ Business Service (except DP)
6 ☐ Government — State/Federal/Local
7 ☐ Public Utility/Communication Systems/Transportation
8 ☐ Mining/Construction/Petroleum/Refining
9 ☐ Other User _____ (please specify)

Vendors (please specify)

- 10 ☐ Manufacturer of Computers, Computer-Related Systems or Peripherals
11 ☐ Computer Service Bureau/Software/Planning/Consulting

- 12 ☐ Computer/Peripheral Dealer/Distributor/Retailer
13 ☐ Other Vendor _____ (please specify)

B. Please check your main job function: (check one)

- 1 ☐ Corporate Management
2 ☐ Financial Management
3 ☐ MIS/DP Management
4 ☐ MIS/DP Operations
5 ☐ Data Communications Management
6 ☐ Data Communications Operations

C. Reason for this inquiry: (check one)

- 1 ☐ Immediate purchase
2 ☐ Future purchase
3 ☐ Information only

D. Is this your personal copy of Computerworld Focus? (check one)

- 1 ☐ My personal copy
2 ☐ I'm a pass-along reader

E. Please check the number of employees in your company: (check one)

- 1 ☐ Over 1,000 employees
2 ☐ 501-1,000 employees
3 ☐ 500 or under

Circle the # that corresponds to the number at the bottom of the item in which you are interested.

1	21	41	61	81	101	121	141	161	181	201	221	241	261	281	301	321	341	361	381
2	22	42	62	82	102	122	142	162	182	202	222	242	262	282	302	322	342	362	382
3	23	43	63	83	103	123	143	163	183	203	223	243	263	283	303	323	343	363	383
4	24	44	64	84	104	124	144	164	184	204	224	244	264	284	304	324	344	364	384
5	25	45	65	85	105	125	145	165	185	205	225	245	265	285	305	325	345	365	385
6	26	46	66	86	106	126	146	166	186	206	226	246	266	286	306	326	346	366	386
7	27	47	67	87	107	127	147	167	187	207	227	247	267	287	307	327	347	367	387
8	28	48	68	88	108	128	148	168	188	208	228	248	268	288	308	328	348	368	388
9	29	49	69	89	109	129	149	169	189	209	229	249	269	289	309	329	349	369	389
10	30	50	70	90	110	130	150	170	190	210	230	250	270	290	310	330	350	370	390
11	31	51	71	91	111	131	151	171	191	211	231	251	271	291	311	331	351	371	391
12	32	52	72	92	112	132	152	172	192	212	232	252	272	292	312	332	352	372	392
13	33	53	73	93	113	133	153	173	193	213	233	253	273	293	313	333	353	373	393
14	34	54	74	94	114	134	154	174	194	214	234	254	274	294	314	334	354	374	394
15	35	55	75	95	115	135	155	175	195	215	235	255	275	295	315	335	355	375	395
16	36	56	76	96	116	136	156	176	196	216	236	256	276	296	316	336	356	376	396
17	37	57	77	97	117	137	157	177	197	217	237	257	277	297	317	337	357	377	397
18	38	58	78	98	118	138	158	178	198	218	238	258	278	298	318	338	358	378	398
19	39	59	79	99	119	139	159	179	199	219	239	259	279	299	319	339	359	379	399
20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

☐ I have circled #400 on the Reader Service Card to enter my Computerworld subscription for one year, 51 weekly issues and 10 Computerworld Focus issues for \$44 and please bill me later. This rate valid only in the U.S.

COMPUTERWORLD FOCUS

Reader Service Cards

fill out these reply cards and circle the numbers that correspond to the numbers on advertisements and editorial items that are of interest to you.

Place
Stamp
Here

Computerworld Focus

Post Office Box 300
Dalton, MA 01227-0300

Computerworld Focus Reader Service Card

(2)

Issue: March 4th / Expires May 13, 1987

Name _____ Title _____

Company _____ Phone () _____

Street _____

City _____ State _____ Zip Code _____

A. Please check the business/industry in which you work: (check one)

- End Users
1 ☐ Manufacturer (other than computer)
2 ☐ Finance/Insurance/Real Estate
3 ☐ Medicine/Law/Education
4 ☐ Wholesale/Retail/Trade
5 ☐ Business Service (except DP)
6 ☐ Government — State/Federal/Local
7 ☐ Public Utility/Communication Systems/Transportation
8 ☐ Mining/Construction/Petroleum/Refining
9 ☐ Other User _____ (please specify)
Vendors
10 ☐ Manufacturer of Computers, Computer-Related Systems or Peripherals
11 ☐ Computer Service Bureau/Software/Planning/Consulting
12 ☐ Computer/Peripheral Dealer/Distributor/Retailer
13 ☐ Other Vendor _____ (please specify)

B. Please check your main job function: (check one)

- 1 ☐ Corporate Management
2 ☐ Financial Management
3 ☐ MIS/DP Management
4 ☐ MIS/DP Operations
5 ☐ Data Communications Management
6 ☐ Data Communications Operations

C. Reason for this inquiry: (check one)

- 1 ☐ Immediate purchase
2 ☐ Future purchase
3 ☐ Information only

D. Is this your personal copy of Computerworld Focus? (check one)

- 1 ☐ My personal copy
2 ☐ I'm a pass-along reader

E. Please check the number of employees in your company: (check one)

- 1 ☐ Over 1,000 employees
2 ☐ 501-1,000 employees
3 ☐ 500 or under

Circle the # that corresponds to the number at the bottom of the item in which you are interested.

1	21	41	61	81	101	121	141	161	181	201	221	241	261	281	301	321	341	361	381
2	22	42	62	82	102	122	142	162	182	202	222	242	262	282	302	322	342	362	382
3	23	43	63	83	103	123	143	163	183	203	223	243	263	283	303	323	343	363	383
4	24	44	64	84	104	124	144	164	184	204	224	244	264	284	304	324	344	364	384
5	25	45	65	85	105	125	145	165	185	205	225	245	265	285	305	325	345	365	385
6	26	46	66	86	106	126	146	166	186	206	226	246	266	286	306	326	346	366	386
7	27	47	67	87	107	127	147	167	187	207	227	247	267	287	307	327	347	367	387
8	28	48	68	88	108	128	148	168	188	208	228	248	268	288	308	328	348	368	388
9	29	49	69	89	109	129	149	169	189	209	229	249	269	289	309	329	349	369	389
10	30	50	70	90	110	130	150	170	190	210	230	250	270	290	310	330	350	370	390
11	31	51	71	91	111	131	151	171	191	211	231	251	271	291	311	331	351	371	391
12	32	52	72	92	112	132	152	172	192	212	232	252	272	292	312	332	352	372	392
13	33	53	73	93	113	133	153	173	193	213	233	253	273	293	313	333	353	373	393
14	34	54	74	94	114	134	154	174	194	214	234	254	274	294	314	334	354	374	394
15	35	55	75	95	115	135	155	175	195	215	235	255	275	295	315	335	355	375	395
16	36	56	76	96	116	136	156	176	196	216	236	256	276	296	316	336	356	376	396
17	37	57	77	97	117	137	157	177	197	217	237	257	277	297	317	337	357	377	397
18	38	58	78	98	118	138	158	178	198	218	238	258	278	298	318	338	358	378	398
19	39	59	79	99	119	139	159	179	199	219	239	259	279	299	319	339	359	379	399
20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400

☐ I have circled #400 on the Reader Service Card to enter my Computerworld subscription for one year, 51 weekly issues and 10 Computerworld Focus issues for \$44 and please bill me later. This rate valid only in the U.S.

Place
Stamp
Here

Computerworld Focus

Post Office Box 300
Dalton, MA 01227-0300

PC PRODUCTS

Opus Systems Unveils Series 300 Unix Workstations

CUPERTINO, Calif. — Opus Systems announced its Series 300 Personal Mainframe Unix workstations. The Series 300 is a 32-bit system based on Fairchild Semiconductor Corp. Clipper technology and uses the IBM Personal Computer AT as an I/O processor and subsystem.

The first Series 300 products

are the 30-MHz Model 350PM and the 25-MHz 340PM.

The Opus Series 300 workstations reportedly offer 4 million instructions per second (MIPS) to 5 MIPS and 4M to 16M bytes of physical memory in a full 4G-byte virtual address space.

The Personal Mainframes feature Opus's port of AT&T

Unix System V Release 3.0, and they can offer concurrent access to Microsoft Corp. MS-DOS, the vendor said.

Compatible with NFS, RFS

The Opus Series 300 machines are also said to be compatible with both Sun Microsystems, Inc.'s Network File System (NFS) and AT&T's Re-

mote File System (RFS).

According to Opus, other standard software includes C and Fortran 77.

Optional software includes Pascal, a series of Green Hills Software Co. optimizing compilers and Visual Engineering, Inc. C-Chart and Prochart packages. Opus also offers a full-featured window system that is an en-

hancement of MIT's X window system.

OEM quantities of the Series 300 Personal Mainframe are available for less than \$3,000 per unit.

For more information, contact Opus Systems, Building 400, 20863 Stevens Creek, Cupertino, Calif. 95014.

Circle Reader Service Number 326

IBM-Compatible 8½-lb Laptop Bows

MOUNTAIN VIEW, Calif. — Grid Systems Corp. has introduced Gridlite, an 8½-lb IBM Personal Computer-compatible laptop computer.

Gridlite features a 10-in. diagonal supertwist LCD screen with an aspect ratio comparable to high-quality CRT screens, the company said. A 1,200/300 bit/sec. internal modem is also available for the machine.

The vendor said Gridlite can be configured with three times more memory than conventional

laptops, with 640K bytes of system random-access memory (RAM) and up to 1M byte of internal Lotus/Intel/Microsoft Expanded Memory Specification (EMS) RAM.

EMS can be used as a high-speed RAM disk or as a memory extension for executing standard and custom programs.

Gridlite also has the capacity for eight additional snap-in read-only memory cartridges, up to 1M byte in total.

Gridlite has an Intel Corp.

80C86 microprocessor with 128K bytes of RAM, an optional 640K bytes of RAM and a 3½-in. internal floppy-disk drive with an option for an external 3½-in. floppy-disk drive.

Gridlite has a base price of \$1,750. EMS RAM is available at \$295 for 0.5M bytes and \$395 for 1M byte.

For further information, contact Grid Systems Corp., 2535 Garcia Ave., Mountain View, Calif. 94043.

Circle Reader Service Number 327



The Gridlite laptop is reportedly the lightest weight unit available and the first to offer Lotus/Intel/Microsoft EMS RAM.

Chorus Data Announces Docutrieve Document Management System

MERRIMACK, N.H. — Chorus Data Systems, Inc. has announced Docutrieve 1000, a document management system that the company claimed allows instant electronic access to document files.

Docutrieve stand-alone for small to medium applications or network it for departmental use. In addition, there are options available for communicating with facsimile machines and remote locations via



Docutrieve 1000 is said to allow instant electronic access to document files.

Docutrieve consists of a high-resolution document scanner; a CPU for data base management and control; a 20-in., full-page video display; a laser printer; both Winchester and removable write-once optical disks for document and data storage; a special keyboard for easier operation; and specialized hardware and software for high-speed document compression, reconstruction and increased performance.

Reported cost savings

The company said that Docutrieve results in cost savings in storage space, processing, retrieval and improved security. Companies can configure Docu-

trieve, the vendor said.

Storage capacity can range from 8,000 document pages on-line to millions of document pages that are accessible in less than five seconds, the company claimed.

Other options include sheet-feed or flatbed scanners, higher capacity storage and a specially designed workstation console.

Prices for Docutrieve systems start at \$35,000.

For further information, contact Chorus Data Systems, Inc., P.O. Box 370, 6 Continental Blvd., Merrimack, N.H. 03054.

Circle Reader Service Number 328

Data Transfer Product Debuts

WALTHAM, Mass. — Artificial Intelligence Corp. has introduced Intellect PC Link, a product that uses conversational English to bring business information directly to personal computers from mainframe data bases such as IBM's DB2.

Intellect PC Link was designed for use with Artificial Intelligence's Intellect, a natural language interface for IBM and Digital Equipment Corp. data bases. The vendor said its PC Link simplifies data transfer between PCs and mainframes, freeing the business user from dealing with complex programming tasks normally required to move data from a mainframe data base management system to a PC application program.

The company claimed that the product also saves MIS involvement because users can perform the transfer function in English.

PC Link runs in IBM VM/CMS or MVS/TSO environments. It requires an IBM or IBM-compatible mainframe, Series 4341 or larger and an IBM Personal Computer XT; AT or an IBM 3270-PC/AT.

Intellect PC Link is priced at \$25,000, including the mainframe portion, with unlimited numbers of PC copies allowed.

For further information, contact Artificial Intelligence Corp., 100 Fifth Ave., Waltham, Mass. 02254.

Circle Reader Service Number 329

Applix Beefs Up Alis OA Software

WESTBORO, Mass. — Applix, Inc. introduced two options, a personal computer connection and a scanned image editing capability, for its Alis integrated office automation software.

PC-Alis is a connection for a Microsoft Corp. MS-DOS-based PC linked to a Unix-based minicomputer or workstation file server through Ethernet.

The product provides PC users access to Alis's integrated multifont word processing, spreadsheet, graphics and data management capabilities.

System requirements

To run, PC-Alis requires a PC with a minimum of 512K bytes of random-access memory, a Hercules Computer Technology, Inc. or enhanced graphics adapter graphics board and a mouse.

Alis's scanned image editing capability is an optional enhancement to Alis's advanced graphics editor. It allows images, including graphs, charts and pictures from scanning devices to be imported to the graphics editor. Imported images with a resolution of up to 300 dot/in. can then be edited.

Pricing varies with the number of users and starts at \$1,945 for the Alis host package, \$495 for PC-Alis and \$950 for the scanned image option. For more information, contact Applix, Inc. at 112 Turnpike Road, Westboro, Mass. 01581.

Circle Reader Service Number 330

To enhance product coverage for our readers, *Computerworld Focus* is instituting a new column in its product section. The column will consist of product- and service-related questions that you, our readers, would like us to ask a particular vendor.

Write us. We'll print the questions

and answers we deem of greatest interest to our readership.

Call us, toll free, at 1-800-343-6474. Or, forward your inquiries to Lory Zoltola, Managing Editor, *Computerworld Focus*, 375 Cochituate Road, Box 880, Framingham, Mass. 01701-9171.

You'll never know unless you ask.

PC PRODUCTS

Computer Friends Unwraps Color Display For Macintosh

PORTLAND, Ore. — Computer Friends, Inc. has introduced Superchroma, a color display for the Apple Computer, Inc. Macintosh.

The Superchroma system includes a video display controller that connects to the modem port on a Macintosh Plus, en-

hanced Macintosh or 512K-byte Macintosh; a high-resolution red-green-blue (RGB) monitor; and Chromapaint software to run on the Macintosh.

The system contains a Motorola, Inc. 68000 processor and display coprocessor plus 1 million pixels of available display

memory and offers a resolution of 640 by 480 pixels. The Superchroma can display 256 simultaneous colors from a palette of 262,144 available colors.

Black and white to color

According to Computer Friends, black-and-white Mac-

paint files can be transferred to the Superchroma display for coloring.

Superchroma is priced at \$2,995 for a system consisting of processor, RGB monitor, cable from a serial port on the Macintosh to the Superchroma processor, cable from a Su-

perchroma processor to a monitor and Chromapaint software.

The enhanced video adapter is \$1,500.

For further information, contact Computer Friends, Inc., 14250 NW Science Park Drive, Portland, Ore. 97229.

Circle Reader Service Number 331

Student 1-2-3 Version Out

READING, Mass. — Addison-Wesley Publishing Co. has introduced Lotus 1-2-3 Student Edition, an education version of Lotus Development Corp.'s 1-2-3 spreadsheet software.

Addison-Wesley said 1-2-3 Student Edition is a fully functional version of 1-2-3 that has been customized for instructional applications. However, although the company said the software includes all the features and functions available with the professional version,



Lotus 1-2-3 has been customized for educational use.

spreadsheet capacity is only 64 columns and 256 rows compared with 256 columns and 8,192 rows for 1-2-3. The Student Edition runs on the IBM Personal Computer and compatibles.

Teacher and student manuals included with the product provide instructor-designed laboratory exercises for use with college courses.

The company added that additional courseware developed by instructors and other software developers can be used with the 1-2-3 Student Edition in connection with specific textbooks or courses.

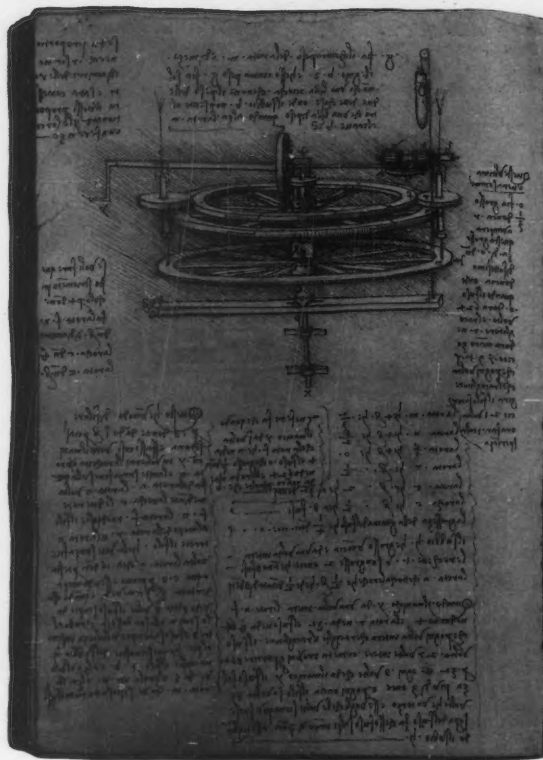
An upgrade coupon is included with the product enabling full-time students to buy the professional version of 1-2-3 at the same price Lotus offers through its educational sales program minus the price of the 1-2-3 Student Edition, according to Addison-Wesley.

1-2-3 Student Edition will be available in April, and pricing is expected to be less than \$50.

For further information, contact Addison-Wesley Publishing Co., Reading, Mass. 01867.

Circle Reader Service Number 332

"My genius is well-documented."



Your most ingenious ideas aren't worth the paper they're printed on if you're not getting them across clearly. Xerox Desktop Publishing Systems were invented to help you get your best ideas onto paper and into action. Quickly. Easily. And brilliantly.

On a Xerox workstation, you combine graphics and words, revising easily until each page looks just the way you imagined it. Then, you send

it to a Xerox laser printer, which produces your finished document at the push of a button — laser-perfect!

There's a Xerox Desktop Publishing System for you, no matter what your needs are. If you need a stand-alone, there's the Xerox Documenter. If you own an IBM PC XT/AT or compatible, there's Xerox Ventura Publisher software. If you need an MS-DOS-based stand-alone, there's a

Xerox Desktop Publishing System that's right for you.

And when your needs expand, Xerox can expand with them, because our Desktop Publishing components are part of a migration path which can include local-area networks as well as a complete line of electronic publishing systems and laser printers.

So whether you're starting from



PC PRODUCTS

Lotus Releases Metro Memory-Resident Desktop Manager

CAMBRIDGE, Mass. — Lotus Development Corp. has unveiled Lotus Metro, a memory-resident desktop manager that combines 12 accessories and a macro generator in one program.

A companion to Lotus products 1-2-3, Symphony, Manuscript and Freelance Plus, Metro's memory-resident operating

system gives users access to pop-up accessory programs that Lotus said are well behaved and do not alter or interfere with the main application being used.

Lotus said Metro was designed to give users comprehensive application management tools such as a text editor, Microsoft Corp. MS-DOS file man-

ager, clipboard, list manager and comprehensive macro capabilities. The desktop accessories bring the personal computer user time and resource management functions, Lotus said.

Machines Metro runs on

Metro runs on the IBM Personal Computer, PC XT, AT, PC

Convertible as well as the Compaq Computer Corp. Portable, Plus and Deskpro computers. It requires two 5 1/4-in., double-sided drives, a minimum of 80K bytes for the stay-resident portion of the program and Microsoft MS-DOS 2.0 or higher. A hard disk is recommended for optimal performance.

Metro is priced at \$85. Lotus said an exchange program will be in effect enabling Lotus Spotlight users to purchase Metro at a reduced rate of \$40.

For further information, contact Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, Mass. 02142.

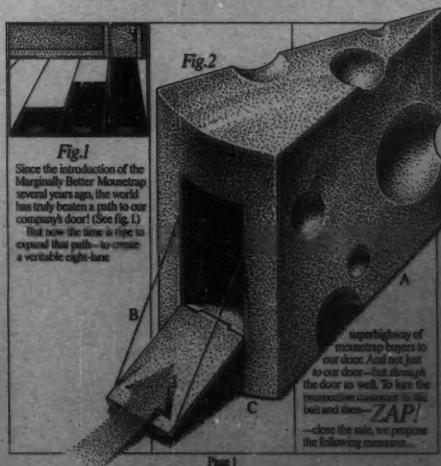
Circle Reader Service Number 333

XEROX

Now yours can be, too." Leonardo da Vinci

A BOLD, CLEVER AND ORIGINAL SCHEME FOR INCREASING SALES

Devised by Ronald T. Drake
For The Marginally Better Mousetrap Company, Inc., Ames, Iowa.



scratch or adding to an existing system, Xerox can help all your documents look like the work of a genius.

Xerox brings out the genius in you.

Xerox Corporation, P.O. Box 24, Rochester, NY 14692.
□ Please have a sales representative contact me.
Please send information on □ The Xerox Documenter.
□ Xerox Ventura Publisher Software. □ Xerox Desktop Publishing System.

NAME (Please Print) _____
COMPANY _____ TITLE _____
ADDRESS _____ CITY _____
STATE _____ ZIP _____ PHONE _____
Or, if you can't wait, call
1-800-TEAM-XRX, ext. 172B
(1-800-832-6979, ext. 172B) 013-3/4-87

XEROX is a trademark of XEROX CORPORATION. VENTURA PUBLISHER is a trademark of VENTURA SOFTWARE, INC. DTP and PC XT/AT are trademarks of INTERNATIONAL BUSINESS MACHINES CORPORATION. MS-DOS is a registered trademark of Microsoft Corporation.

RTI Launches Ingres For PCs

ALAMEDA, Calif. — Relational Technology, Inc. (RTI) introduced Ingres for PCs, a line of relational data base software for IBM Personal Computer XT, ATs and compatibles.

RTI's line of PC products includes the Ingres relational data base management system, Ingres/Star data base networking and Visual Programming, the firm's fourth-generation language and embedded SQL application development tools.

The software fully implements the SQL data base language and is compatible with IBM DB2, American National Standards Institute and X/Open SQL.

In addition, the product provides complete, transparent data and application portability between the PC and Digital Equipment Corp. VAX VMS, IBM mainframe and Unix operating systems.

Four primary applications

The Ingres PC line was designed for four primary applications. It can act as either a stand-alone PC data base system or serve on a network with minicomputers and mainframes as part of a distributed data base system. Ingres for PCs can also act as a bridge, enabling PC users to access Ingres data residing on a minicomputer or mainframe and use it with applications such as Lotus Development Corp. 1-2-3. Finally, the software can be used as a fourth-generation language application development environment for PC, mini or mainframe applications.

Ingres for PCs includes six product modules that can be purchased separately or together, and prices for a typical configuration can range from \$800 to \$2,000. Ingres software comes with technical documentation and on-line instruction. Also, users can opt to purchase hot-line telephone support and custom on-site training similar to Ingres's support for mini and mainframe products. Delivery begins in March.

For further information, contact Relational Technology, Inc., 1080 Marina Village Pkwy., Alameda, Calif. 94501.

Circle Reader Service Number 334

CALENDAR

March 3-5, Chicago — **Corporate Electronic Publishing Systems (CEPS)**. Contact: Cahners Exposition Group, Customer Services, CEPS, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

March 9-11, San Francisco — **Controlling Software Projects: Management, Measurement and Estimation**. Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

March 9-11, Chicago — **Local Communications Systems**. Also being held April 6-8, San Francisco; May 11-13, New York; June 15-17, Dallas. Contact: Systems Technology Forum, Suite 150, 10201 Lee Highway, Fairfax, Va. 22030.

March 9-11, San Francisco — **TI Networking**. Also being held April 29-May 1, Chicago; May 27-29, Washington, D.C. Contact: Systems Technology Forum, Suite 150, 10201 Lee Highway, Fairfax, Va. 22030.

March 9-12, Washington, D.C. — **FOSE Computer Graphics '87**. Contact: National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

March 12-13, Chicago — **Telecom Management Software: How to Plan and Select**. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

March 15-18, Atlanta — **The 5th Annual Computer-Based Training Conference and Exposition**. Contact: CBT Conference, Weingarten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

March 16-18, Washington, D.C. — **Network Protocols and Standards**. Contact: Systems Technology Forum, Suite 150, 10201 Lee Highway, Fairfax, Va. 22030.

March 19-20, Chicago — **Integrated Voice/Data Networks: Strategies and**

Alternatives. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

March 20-22, New York — **Sixth Annual Office Systems Research Conference**. Contact: Office Systems Research Association, 574 University Center, Cleveland, Ohio 44115.

March 22-26, Philadelphia — **National Computer Graphics Association's Computer Graphics '87**. Contact: National Computer Graphics Association, Suite 200, 2722 Merrilee Drive, Fairfax, Va. 22031.

March 23-25, Boston — **Optimizing Software Productivity and Quality**. Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

March 24-25, San Francisco — **Contract Negotiation and System Implementation**. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

March 24-26, Los Angeles — **Optical Information Systems West '87**. Contact: Conference Management Corp., P.O. Box 4990, 200 Connecticut Ave., Norwalk, Conn. 06856.

March 26-27, New York — **Metropolitan-Area Networks**. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

March 30-April 2, Las Vegas — **Interface '87**. Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

April 6-11, Paris — **SICOB '87 International Exhibition of Data Processing, Telematics, Communication, Office Organization and Office Automation**. Contact: SICOB, 4, Place De Valois, 75001 Paris.

Computerworld Sales Offices

Lee Vidmer, **Publisher/President**. Edward P. Marecki, **Vice President/Sales**. Carolyn Novack, **Display Advertising Manager**. Peter Slingluff, **Product Classified Advertising, Account Manager**. COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Phone: (617) 879-0700. Telex: 95-1153.

BOSTON SALES OFFICE: Michael F. Kelleher, **Northern Regional Manager**. David Peterson, Bill Cadigan, Sherry Driscoll, **District Managers**. John Watts, **Account Manager**. Alice Longley, **Sales Assistant**. COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Phone: (617) 879-0700. Telex: 95-1153.

NEW YORK SALES OFFICE: Michael J. Masters, **Eastern Regional Director**. Doug Cheney, **Senior District Manager**. Fred LoSapio, Frank Genovese, **District Managers**. Jennifer Lindsey, **Account Manager**. Mary Burke, **Sales Assistant**. COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, N.J. 07652. Phone: (201) 967-1350.

CHICAGO SALES OFFICE: Russ Gerches, **Midwest Regional Manager**. Larry Craven, Kevin McPherson, **District Managers**. Kathy Sullivant, **Sales Assistant**. COMPUTERWORLD, 2600 South River Road, Suite 304, Des Plaines, Ill. 60018. Phone: (312) 827-4433.

LOS ANGELES SALES OFFICE: William J. Healey, **Western Regional Director**. Carolyn Knox, **District Manager**. Beverly Raus, **Account Coordinator**. COMPUTERWORLD, 18004 Skypark Circle, Suite 255, Irvine, Calif. 92714. Phone: (714) 261-1230.

SAN FRANCISCO SALES OFFICE: William J. Healey, **Western Regional Director**. Barry G. Milione, **Senior District Manager**. Ernie Chamberlain, Mark V. Glasner, **District Managers**. Ruth Gordon, **Account Coordinator**. COMPUTERWORLD, 300 Broadway, Suite 20, San Francisco, Calif. 94133. Phone: (415) 421-7330.

ATLANTA SALES OFFICE: Michael J. Masters, **Eastern Regional Director**. Jeffrey Melnick, **District Manager**. Melissa Christie, **Sales Assistant**. COMPUTERWORLD, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319. Phone: (404) 394-0758.

DALLAS SALES OFFICE: William J. Healey, **Western Regional Director**. Mark V. Glasner, **District Manager**. COMPUTERWORLD, 300 Broadway, Suite 20, San Francisco, CA 94133. Phone: (214) 991-8366.

WASHINGTON D.C. SALES OFFICE: Michael J. Masters, **Eastern Regional Director**. Bernie Hockswender, **District Manager**. COMPUTERWORLD, 3022 Javier Road, #210, Fairfax, VA 22031. Phone: (703) 280-2027.

RECRUITMENT ADVERTISING SALES OFFICES

New England Recruitment Manager/Al DeMille
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

New York Recruitment Manager/Mary Ellen Hessler
Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

Midwest Recruitment Manager/Kevin Johnson
2600 S. River Road, Suite 304, Des Plaines, IL 60018 (312) 827-4433

Western Recruitment Manager/Barbara Murphy
18004 Skypark Circle, Suite 100, Irvine, CA 92714 (714) 250-1350

RECRUITMENT TELEMARKETING ACCOUNT EXECUTIVES
New England, New York/Jay Novack, Mid-Atlantic/Pauline Smith,

Midwest/Ellen Casey Western/Nancy Percival
Toll Free: 1-800-343-6474 or (617) 879-0700

ADVERTISERS INDEX

Adobe Systems Inc.	39
415-852-0271	
AFIPS	12
800-NCC-1987	
CGI Systems	Cover 4
800-PAC-1866; 914-735-5030	
CW Circulation	40
800-544-3712; in PA, 215-768-0388	
CWIMS Germany	30
617-879-0700	
DataEase International, Inc.	Cover 3
800-334-EASE; 203-374-8000	
Diconix	14
800-DICONIX	
Epson America, Inc.	32-33
800-421-5426	
Fibronics	20
800-Double; 617-778-0700	
Fujitsu America	38
800-626-4686	
Hewlett-Packard Co.	2-3
800-367-4772, Dept. 132B	
IDE Associates, Inc.	4
800-257-5027; 617-663-6878	
Interactive Solutions, Inc.	13
201-488-3708; 212-475-2400	
International Data Group	34-35
617-875-5000	
Leasametric	6
415-574-5797	
MCI	8-9
800-345-1043	
Micro Data Base Systems, Inc.	18
800-344-5832; 317-463-2581	
Nastec Corp.	28
800-872-8296; 313-353-3300	
On-Line Software International, Inc.	24-25
800-642-0177; in CANADA, 201-592-0009	
People Sciences, Inc.	7
201-762-8259	
Realia	27
312-346-0642	
Sage Software, Inc.	Cover 2
800-638-8703; 301-230-3200	
SearchLink	10
800-843-7337 (THE-SEER)	
UNIRAS	16
214-980-1600	
Xerox Corp.	42-43
800-TEAM-XRX, ext. 172B	

What it does is hard. How it does it is easy.



9:02: "A database manager? How many months will this take?"



12:04: "Wow, my first report. And there's still time for lunch."



2:19: "From now on I'm taking the easy way out."

The reason most people use a database manager is to make work easier. But most database managers are so difficult to use they end up making work harder.

That's why many companies that had already standardized on complex systems like dBASE™ are re-standardizing on DataEase™.

DataEase. No database manager that does as much is easier.

DataEase is easy because you don't have to program. Menus with easy to understand commands like "cut" and "paste" lead you through the process of setting up forms, files and reports.

And DataEase is just as powerful as much more complex systems. But the power of DataEase becomes available as you need it. So the transition from building simple applications to building complex ones is smooth. And easy.

DataEase also makes it easy to use information stored on other computers. Because the only thing that changes is where the data comes from. DataEase LAN™ and DataEase Connect™ automatically get the information you need. No matter where it is—on another PC, LAN server, minicomputer or mainframe.

Creating complex business graphics is easy with DataEase GrafTalk™. And DataEase Developer™ has everything you need to document and encrypt your applications and build demonstration disks. And, of course, it's easy too.

The DataEase Family. They can do everything. And everything they do is easy.

Send us the coupon for more about the DataEase Family, including a free DataEase demonstration disk. Or call 1-800-334-EASE, or 203-374-8000.

Comp Word 3/4/87
DataEase International, Inc.
12 Cambridge Drive, Trumbull, CT 06611
1-800-334-EASE

☐ Please send me more information about
☐ DataEase ☐ LAN ☐ Connect
☐ GrafTalk ☐ Developer

☐ Please send a free DataEase demonstration disk.

☐ Please have a DataEase representative call.

Name _____ Title _____

Company _____ Phone _____

Address _____

City _____ State _____ Zip _____

No. of PCs on site: ☐ 1 ☐ 1-10 ☐ 11-50 ☐ 51+

☐ IBMPC/XT/AT ☐ IBMCOMPATIBLES ☐ WANG ☐ DEC ☐ OTHER

Software Solutions, Inc. is now DataEase International, Inc.

DATAEASE™

If it was hard to use
we would have called it DataHard.

Canada (416) 231-1070 • United Kingdom (01 564 0962) • Italy (2 436 0097) • Benelux (011 73 41985) (Netherlands) • Scandinavia (011 71 80166) (Sweden)
Switzerland (061 152) • West Germany (089 461 3072) (Munich) • Australia (03) 499-2265 • Brazil (11 681 0600)

dBASE is a trademark of Ashton-Tate.

CIRCLE READER SERVICE NUMBER 255

©1987 DataEase International, Inc.

BELIEF[#]2:

You can never really count on the
reliability of your COBOL programs.

REALITY:

"Our PACBASE developed COBOL
programs have been solid. Of the 383 on-line
and 165 batch programs currently in
production, I know of none that have abended."

Pat Guidash
Director of Systems Development
Hercules, Inc.

PACBASE

Full life cycle system development software.

The strategy for maximizing return on
your MIS investment through cost effective
development of reliable COBOL systems
designed for change.



CGI Systems, Inc., One Blue Hill Plaza, Pearl River, NY 10965 (914) 735-5030
1-800-PAC-1866

*PACBASE provides DBMS support for IBM (IMS[®] and DB2[™]), Honeywell, Sperry and
independent vendors in hundreds of installations worldwide.*

IMS[®] and DB2[™] are registered trademarks of International Business Machines Corporation.

A BULL-READER SERVICE SOURCE # 001

